T3SU 300
T3 Service Unit

USER MANUAL

1200217L1	T3SU 300
1200217L2	T3SU 300 with Internal Modem
1200218L1	HSSI DTE Interface Card
1200219L1	V.35 DTE Interface Card

61200217L1-1B
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OpenView is a trademark of Hewlett-Packard Company.
Spectrum is a registered trademark of Cabletron.
Netview is a registered trademark of IBM.

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ABOUT THIS MANUAL

This manual is arranged so you can quickly and easily find the information you need. The following is an overview of the contents of this manual:

- Chapter 1, Introduction, familiarizes you with T3 networks and T3SU 300 highlights and gives a brief explanation of options that may be purchased for use with the T3SU 300.
- Chapter 2, Installation and Operation, describes the T3SU 300 connectors (pin assignments are given in Appendix A), provides installation instructions, and explains how to operate your T3SU 300 using the terminal interface.
- Chapter 3, Configuration, explains how to access the T3SU 300 Configuration menu, describes selections made in the Configuration menus, and provides a menu tree of all of the available Configuration options.
- Chapter 4, Status, describes each field of the Status menu.
- Chapter 5, Statistics, explains how to access statistical information for the T3SU 300 and describes each field.
- Chapter 6, Diagnostics, explains how to diagnose problems using loopback and BERT tests.
- Chapter 7, Applications, provides examples of some common T3SU 300 applications. This chapter includes network diagrams as well as configuration tables for each example.
- Appendix A provides pinouts for the T3SU 300 connectors.
- Appendix B contains product specifications.
- Appendix C is a list of acronyms and abbreviations used in this document.
- Appendix D is a glossary.

Notes provide additional useful information.

Cautions signify information that could prevent service interruption.

Warnings provide information that could prevent damage to the equipment or endangerment to human life.

IMPORTANT SAFETY INSTRUCTIONS
SAVE THESE INSTRUCTIONS

When using your telephone equipment, please follow these basic safety precautions to reduce the risk of fire, electrical shock, or personal injury:

1. Do not use this product near water, such as near a bath tub, wash bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.
2. Avoid using a telephone (other than a cordless-type) during an electrical storm. There is a remote risk of shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord, power supply, and / or batteries indicated in the manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for special disposal instructions.

FCC regulations require that the following information be provided in this manual:

1. This equipment complies with Part 68 of FCC rules. On the bottom of the equipment housing is a label showing the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, provide this information to the telephone company.
2. If this equipment causes harm to the telephone network, the telephone company may temporarily discontinue service. If possible, advance notification is given; otherwise, notification is given as soon as possible. The telephone company will advise the customer of the right to file a complaint with the FCC.
3. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of this equipment. Advance notification and the opportunity to maintain uninterrupted service are given.
4. If experiencing difficulty with this equipment, please contact ADTRAN for repair and warranty information. The telephone company may require this equipment to be disconnected from the network until the problem is corrected or it is certain the equipment is not malfunctioning.
5. This unit contains no user-serviceable parts.
6. An FCC compliant telephone cord with a modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using an FCC compatible modular jack, which is Part 68 compliant.
7. The following information may be required when applying to the local telephone company for a dial-up line for the V.34 modem:

Service Type	REN	FIC	USOC
Loop Start (V.34)	0.8B / 0.4A	02LS2	RJ-11C

8. The REN is useful in determining the quantity of devices you may connect to your telephone line and still have all of those devices ring when your number is called. In most areas, the sum of the RENs of all devices should not exceed five. To be certain of the number of devices you may connect to your line as determined by the REN, call your telephone company to determine the maximum REN for your calling area.
9. This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.

YEAR 2000 COMPLIANCE

All ADTRAN transmission hardware and software products have been tested and found to be fully compliant with the YEAR 2000 requirements. This is true for all models and revisions regardless of the date of manufacture or delivery.

Users who wish to independently verify that specific products are in compliance may contact ADTRAN Technical Support at 1-888-423-8726.

FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio frequencies. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded cables must be used with this unit to ensure compliance with Class A FCC limits.

WARNING *Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

CANADIAN EMISSIONS REQUIREMENTS

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled “Digital Apparatus,” ICES-003 of the Department of Communications.

Cet appareil nuerique respecte les limites de bruits radioelectriques applicables aux appareils numeriques de Class A prescrites dans la norme sur le materiel brouilleur: “Appareils Numeriques,” NMB-003 edictee par le ministre des Communications.

CANADIAN EQUIPMENT LIMITATIONS

Notice: The Canadian Industry and Science Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable methods of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above limitations may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Users should not attempt to make such connections themselves, but should contract the appropriate electric inspection authority, or an electrician, as appropriate.

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all devices does not exceed 100.

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Chapter 1 Introduction

PRODUCT OVERVIEW

The T3SU 300 is a multiport DSU/CSU (data service unit/channel service unit) that provides access to T3 services. The unit provides a cost-effective, versatile approach for migrating T1 services to T3. The TDM (time division multiplexer) multiport design allows you to share the cost of a T3 line between multiple applications. This unit maximizes the use of T3 services, providing up to four data ports capable of transmitting and receiving high-capacity, real time data.

A HSSI (high speed serial interface) port is built in along with three slots which accept additional HSSI or V.35 interface cards. The HSSI interfaces support rates between 75 kbps and 44.2 Mbps in 75 kbps increments. The high speed V.35 interface option supports rates up to 10 Mbps in increments of 75 kbps.

Embedded SNMP (simple network management protocol) and TELNET are available through either a SLIP/PPP or a 10baseT ethernet port. Through the Management Information Base II(MIB II), RFC 1407 standards, and an ADTRAN enterprise MIB, the T3SU 300 can be configured, monitored, and diagnosed using standard SNMP network management programs such as Hewlett Packard's HP OpenView™, IBM's Netview™, and Cabletron's Spectrum™.

Complete configuration, diagnostics, and performance monitoring are available through SNMP, TELNET, or a VT 100 terminal interface. This connection can be made via ethernet, a local EIA-232

link, or through the built-in V.34 modem (1200217L2 only). Advanced dial-out on trap capabilities through the built-in modem allow the T3SU 300 to contact remote hosts and alert them to DSX-3 network conditions (without dedicated management connections). The T3SU 300 is designed for either desktop use or installation in a 19-inch rack.

The major features or the T3SU 300 are as follows:

- Full feature multiport T3 DSU / CSU
- Maximum of four user data ports (HSSI or high speed V.35) available
- Automatic or manual remote configuration
- Embedded SNMP and TELNET management through 10baseT ethernet or SLIP / PPP
- Detailed performance monitoring for local and remote units
- Simplified configuration through detailed VT 100 terminal menu structure
- Optional integrated V.34 modem for dial-up and dial-out access (product version 1200212L2 only)
- Standard 5-year warranty

T3 OVERVIEW

T3 provides the same bandwidth as 28 T1s and is used to interconnect high-speed bridges, routers, front-end processors, and data terminal equipment (DTE). T3 service plays a major role in Internet backbones and public organizations needing broad bandwidth for WAN (wide area network) connectivity.

SNMP

The T3SU 300's embedded SNMP feature allows the unit to be accessed and controlled by a network manager through either the auxiliary (AUX) control port or the 10baseT local area network

(LAN) port. The T3SU 300 supports the MIB-II standard, RFC 1213, and the ADTRAN Enterprise Specific MIB.

MIB files are available from ADTRAN in the support section of the ADTRAN Web page at www.adtran.com.

The term SNMP broadly refers to the message protocols used to exchange information between the network management system (NMS) and the managed devices, as well as to the structure of device management databases. SNMP has three basic components:

Network Manager

Control programs that collect, control, and present data pertinent to the operation of the network devices. These programs reside on a network management station.

Agent

Control program that resides in every network device. This program responds to queries and commands from the network manager, returns requested information or invokes configuration changes initiated by the manager, and sends unsolicited traps to the manager.

MIB

Industry standard presentation of all status and configuration parameters supported by a network device.

TELNET

TELNET provides a password-protected, remote login facility to the T3SU 300 that allows a remote user to control the T3SU 300 through the terminal menus. Only one TELNET session may be active at a time.

INTERFACE OPTION CARDS

Optional interface cards may be purchased to equip the T3SU 300 with up to three additional ports. Both HSSI and V.35 interface cards are available.

HSSI Card

The optional HSSI card plugs into one of the three card slots on the rear of the T3SU 300. With optional HSSI cards installed, the total 44.2 Mbps bandwidth of the T3 can be divided among the total number of ports to provide multiple data channels over the T3. The total bandwidth of the T3 can be divided among the available ports in any fashion, as long as the divisions are on 75 kbps boundaries.

The HSSI card can be hot inserted or swapped. When it is inserted in a slot on the rear panel and its faceplate is secured to the rear panel of the T3SU 300 with the integral thumb screws, a PCMCIA type connector on the card mates with a compatible connector on the main board of the T3SU 300. A standard 50-pin HSSI connector is then available for DTE connections. See the section *DTE Port Interface Card Slots* on page 2-4 for more information on installing option cards.

V.35 Card

The optional V.35 card plugs into the card slots on the rear of the T3SU 300 to provide a V.35-type DTE interface. Operation of the V.35 card is similar to that of the HSSI card except that the maximum bandwidth of the V.35 card is limited to 10 Mbps.

Like the HSSI card, the V.35 card can be hot inserted or swapped, and it installs just as the HSSI card does. Instead of the standard HSSI connector, this card contains a standard 34-pin V.35 connector for DTE connections. See the section *DTE Port Interface Card Slots* on page 2-4 for more information on installing option cards.

WARRANTY AND CUSTOMER SERVICE

ADTRAN will replace or repair this product within five years from the date of shipment if it does not meet its published specifications or fails while in service. For detailed warranty, repair, and return information refer to the ADTRAN Equipment Warranty and Repair and Return Policy Procedure.

Return Material Authorization (RMA) is required prior to returning equipment to ADTRAN.

For service, RMA requests, or further information, contact one of the numbers listed on the inside back cover of this manual.

Chapter 2 Installation and Operation

UNPACK, INSPECT, POWER UP

Receiving Inspection

Carefully inspect the T3SU 300 for any damage that may have occurred in shipment. If damage is suspected, file a claim immediately with the carrier and contact ADTRAN Technical Support (see the back cover of this manual). Keep the original shipping container to use for future shipment or verification of damage during shipment.

ADTRAN Shipments Include

The following items are included in ADTRAN shipments of the T3SU 300:

- T3SU 300 unit
- User manual
- An 8-position modular to 8-position modular cable (two of these cables are included in the 1200217L1 version)
- An 8-position modular to DB-25 female connector
- An 8-position modular to DB-25 male connector (1200217L1 version only)
- A 4-position modular to 4-position modular cable (1200217L2 version only)
- Mounting ears for 19-inch rack installation
- Rubber feet for stand-alone use

The ADTRAN T3SU 300 MIB is available in the support section of the ADTRAN Web page at www.adtran.com.

Customer Provides

The customer provides an interface cable for each port used. Each cable should be either HSSI or V.35.

Power Up

Each T3SU 300 unit is provided with a captive eight-foot power cord, terminated by a three-prong plug which connects to a grounded 115 VAC power receptacle.

Power to the T3SU 300 must be provided from a grounded 115 VAC, 60 Hz receptacle.

INSTALLING THE UNIT

The T3SU 300 can be used as a desktop stand-alone device or mounted into a standard 19-inch equipment rack. See the section *Establishing Terminal Connection* on page 2-6 for information on terminal configuration.

Rackmount Installation

Follow these steps to mount your unit into a rack:

1. Install the 19-inch rackmount flanges on each side of the T3SU 300 enclosure at one of the three available positions.

Be sure to install the flanges with the screws provided.

2. After the flanges have been installed, position the T3SU 300 at the correct location within the rack and secure the mounting flanges to the mounting rails of the rack.
3. Make all network, DTE, and power connections to the rear of the unit.
4. Using the 8-position modular to DB-25 female connector and the 8-position modular to 8-position modular cable, connect a VT 100 terminal device to the **CONTROL** interface jack on the front panel of the unit.

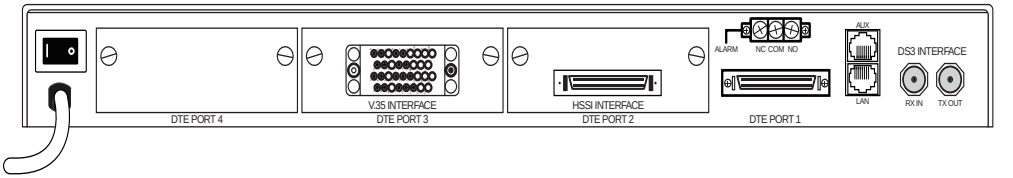
Desktop Installation

Follow these steps when using your T3SU 300 as a desktop unit:

1. Affix the four adhesive-backed rubber feet to the bottom of the unit, one in each of the four corners. The feet should be placed approximately one inch from the front or back and one inch from the sides of the unit
2. Make all network, DTE, and power connections to the rear of the unit.
3. Using the 8-position modular to DB-25 female connector and the 8-position modular to 8-position modular cable, connect a VT 100 terminal device to the **CONTROL** interface jack on the front panel of the unit.

REAR PANEL

The T3SU 300 is equipped with three option card slots, a built-in HSSI interface, an alarm output terminal block, an auxiliary (AUX) port, a LAN port, and a DS3 interface. Pin assignments for connectors are given in the appendix *Pinouts* on page A-1. The T3SU 300 rear panel is shown in *Figure 2-1*.



Item	Function
On/Off Switch	On/off control
115 VAC Connection	Power connection
DTE Ports 2-4	Interface option card slots
Alarm	NC/NO relay contacts
DTE Port 1	Integral HSSI interface
Aux	Function depends on product version (see page 2-5)
LAN	10baseT LAN connection
DS3 Interface	T3 service connection

Figure 2-1. T3SU 300 Rear View

DTE Port Interface Card Slots

The T3SU 300 rear panel has three card slots for the installation of optional interface cards. To insert cards, perform the following procedure:

1. Remove blank slot cover from the rear of the T3SU 300.
2. Slide the card into the corresponding rear slot until the card panel is flush with the T3SU 300 chassis.
3. Push in thumbscrews and turn clockwise to secure the card and ensure proper connection to the main board of the T3SU 300.

Alarm Connector

The alarm connector is a three-position, screw-type terminal block that is connected to the three contacts of a Form C-type relay on the main board of the T3SU 300. This relay is activated any time the T3SU 300 detects an alarm condition on the T3 network interface.

The alarm function can be disabled through the **ALARM RELAY** selection of the **CONFIGURATION** menu.

DTE Port 1 (HSSI Interface)

DTE port 1 is a built-in HSSI port that resides on the main board of the T3SU 300. The bandwidth of this port is configurable from 75 kbps to 44.2 Mbps in 75 kbps increments. When a single application requires the full 44.2 Mbps of bandwidth, the T3SU 300 does not have to be equipped with additional port cards.

Auxiliary Port

The auxiliary (AUX) port is an 8-pin modular jack located on the rear panel of the T3SU 300. The function of this port differs, depending on which version of the T3SU 300 you have (1200217L1 or 1200217L2).

For the 1200217L1 product, this port provides a DTE-type, EIA-232 asynchronous serial port. This port can be connected to a VT 100 terminal or to a device running SLIP or async PPP. This port can also connect to an external modem to provide dialup VT 100, SLIP, or PPP. This port's mode and baud rate are selected in the **SYSTEM MANAGEMENT** portion of the **CONFIGURATION** menu.

For the 1200217L2 product, the AUX port provides a telephone line (POTS) connection for the internal V.34 modem.

For both versions of the product, the T3SU 300 can be configured as a dial-in host and also as a dial-out-on-TRAP device (meaning that the unit dials out to a specified host to report error conditions). Configuration for both the external (L1) and internal (L2) modem parameters is done in the **DIALUP OPTIONS** menu under the **SYSTEM MANAGEMENT** portion of the **CONFIGURATION** menu (**CONFIGURATION** -> **SYSTEM MANAGEMENT** -> **DIALUP OPTIONS**).

LAN Port

The LAN port is an 8-pin modular connector that provides a 10baseT ethernet LAN interface. This LAN interface is used for SNMP and TELNET control.

DS3 Interface

The DS3 network interface is a full-duplex circuit provided by two BNC coaxial cable connections. The receive data from the network is connected to the RX (In) connector while the transmit data from the T3SU 300 is connected to the TX (Out) connector.

FRONT PANEL

The T3SU 300 faceplate is shown in *Figure 2-2*. Descriptions of each part of the front panel follow.

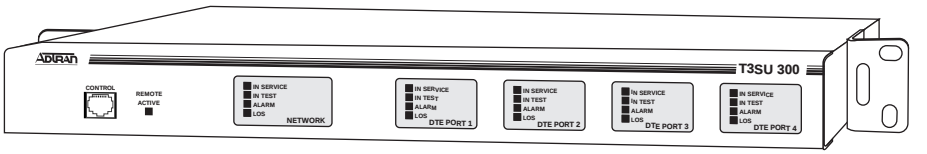


Figure 2-2. T3SU 300 Front Panel

Control Port

The T3SU 300 has an 8-pin modular jack labeled **CONTROL**. The control port provides connection to a VT 100 EIA-232 compatible interface.

Establishing Terminal Connection

To control the T3SU 300 using a VT 100 terminal, follow this procedure:

1. Configure the VT 100 terminal for 9600 baud, 8-bit characters, no parity, and one stop bit (9600, 8N1).

2. Using the ADTRAN-provided terminal interface cable adapter, connect the DTE port of a terminal to the 8-pin modular jack labeled **Control** on the front panel of the T3SU 300.
3. Initialize the terminal session.
4. Press **Enter** repeatedly until the password prompt appears.
5. Enter the password. The factory default password is **adtran**. The **MAIN** menu appears. See *Figure 2-3*.
6. Make selections by entering the number corresponding to the chosen parameter. Press **ESC** to return to the previous screen. End a terminal session by selecting **LOGOUT** from the **MAIN** menu or by pressing **Ctl-C** at any time.

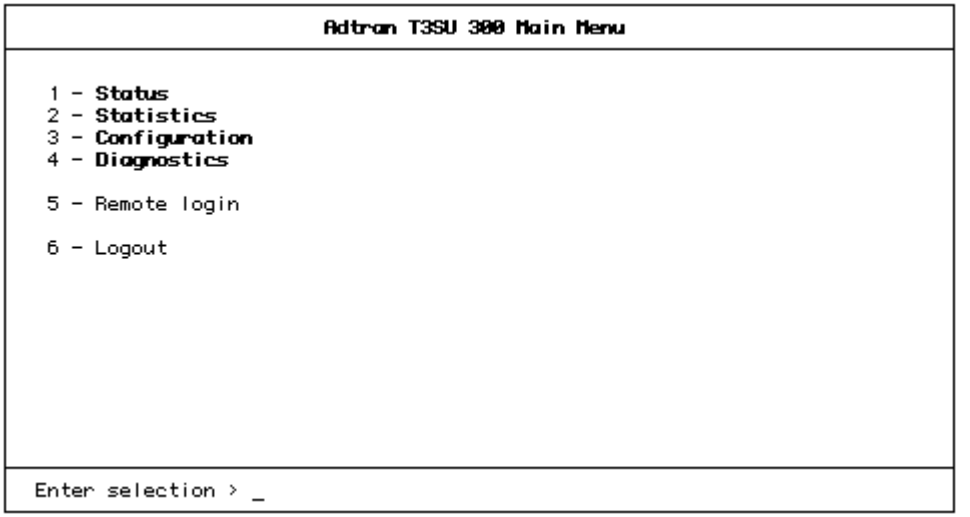


Figure 2-3. Terminal Main Menu

Navigating Within the Menus

Navigate within the T3SU 300 terminal menus using the following procedures:

If you want to...	Press...
select an item	the number corresponding to your choice, and then press the **Enter** key.
scroll between screens within the same selection	the up and down arrow keys. Additional screens are available when <up> or <down> is displayed in the right-hand side of the menu.
return to the previous menu	the **ESC** key.
end the terminal session	**Ctl-C**.
refresh the display	**Ctl-R**.

The T3SU 300 **MAIN** menu consists of the following sections:

Status
This selection provides status information on the Network and DTE ports. See the chapter *Status* on page 4-1 for more information.

Statistics
This selection provides statistical information for the Network port. See the chapter *Statistics* on page 5-1 for more information.

Configuration
The **CONFIGURATION** menu is used to set network, DTE, and system management parameters. See the chapter *Configuration* on page 3-1 for more detailed information.

Diagnostics
The **DIAGNOSTICS** menu is used to perform loopback and BERT tests. See the chapter *Diagnostics* on page 6-1 for more detailed information.

Remote Login
The **REMOTE LOGIN** selection allows you to configure the remote T3SU 300. The remote unit's password is required at login. The **DATALINK** option (in the **DS3 NETWORK CONFIGURATION** menu) must be enabled in order to perform remote configuration.

Logout

The **LOGOUT** selection ends the terminal session and logs out of the system. Password entry is required before a new session can begin.

LED Descriptions

The T3SU 300 has LED status indicators for remote access, the network port, and for each individual DTE port. These LEDs are identified as follows:

Remote Active

This LED is solid when a remote configuration session is taking place through a TELNET session or from the remote end T3SU 300. It flashes when the unit is being accessed locally through the front panel **Control** port.

Network LEDs

In Service

This LED is active when a valid signal is being received on the DS3 interface.

In Test

This LED is active when the network interface has been put in loopback by the service provider.

Alarm

This LED is active when the DS3 receive signal contains framing errors, the yellow alarm is received from the far end unit, or other alarm messages are received from the network.

LOS

This LED is active when no receive signal from the network is detected on the Rx (in) circuit.

DTE Port LEDs

Status

This LED indicates the following conditions:

LED	Condition
Off	No option card is installed.
Flashing green	Interface is available but not configured.
On green	Interface is available and configured.
On red	DTE fault condition (for HSSI interface, no clock from DTE).
On yellow	For HSSI interface, terminal available (TA) signal inactive.

In Test
This LED is active when the DTE interface is in a loopback condition or is performing a BERT test.

TD
This LED is active when the T3SU 300 DTE port is transmitting data.

RD
This LED is active when the T3SU 300 DTE port is receiving data.

Chapter 3 Configuration

The T3SU 300 can be configured locally and remotely. Local configuration is accomplished through a 10baseT ethernet connection, a SLIP / PPP port, or a VT 100 terminal. Remote configuration can take place through the T3 datalink using a local T3SU 300.

The **CONFIGURATION** menu consists of the following submenus relating to specific interfaces or functions:

DS3 NETWORK
DTE PORTS
SYSTEM MANAGEMENT
UTILITIES
SAVE CONFIGURATION

The Main configuration terminal menu is shown in *Figure 3-1*. The complete configuration menu tree is given at the end of this chapter in *Figure 3-12*. Detailed descriptions of each individual menu parameter are given in the following sections. These sections are divided by the five submenus: **DS3 NETWORK** (page 3-2), **DTE PORTS** (page 3-4), **SYSTEM MANAGEMENT** (page 3-11), **UTILITIES** (page 3-22), and **SAVE CONFIGURATION** (page 3-24).

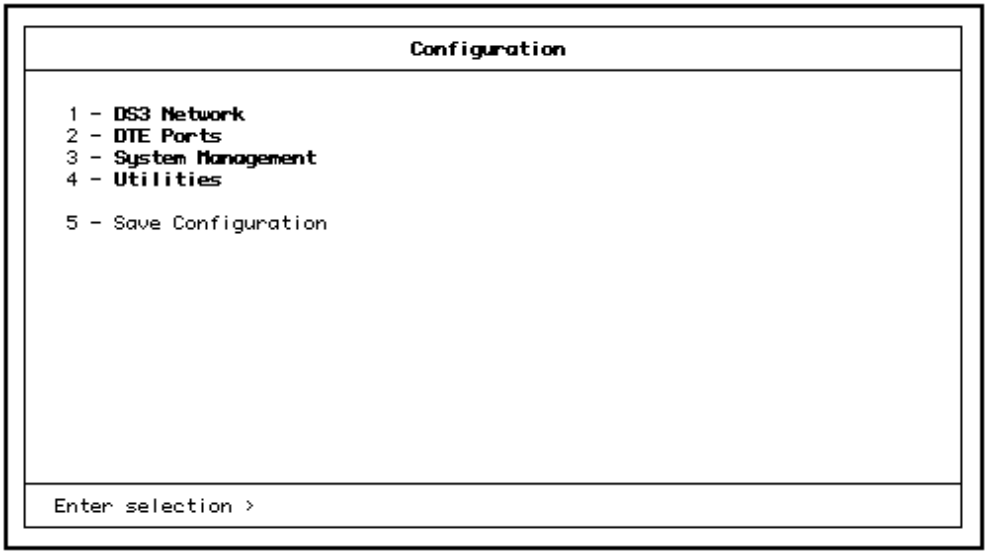


Figure 3-1. Configuration Main Menu

DS3 NETWORK

Select **1 DS3 NETWORK** to access the network configuration parameters. Configure the T3SU 300 network settings to match the T3 signal received from the service provider. During remote configuration, this menu is read-only. The **DS3 NETWORK CONFIGURATION** menu is shown in *Figure 3-2*. Descriptions of the **DS3 NETWORK** fields follow the figure.

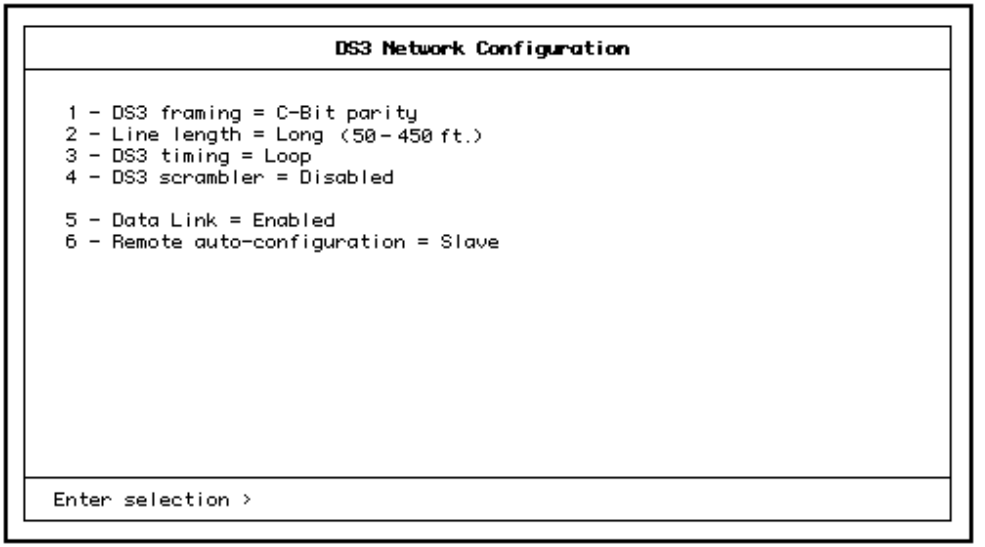


Figure 3-2. DS3 Network Configuration Menu

DS3 Framing

Set the framing format to match the format of the receive signal at the network interface. C-bit parity and M13 framing formats are supported.

Line Length

Set the line length to reflect the physical length of the DS3 network line. Set to **LONG** if the cabling distance exceeds 50 feet; set to **SHORT** if the distance is less than 50 feet.

DS3 Timing

Set the timing to **LOOP** if the T3SU 300 is to derive timing from the network; set to **LOCAL** if the unit is to be the master timing source for the circuit. In most cases, the unit should be configured for **LOOP** timing.

DS3 Scrambler

Enable this option to scramble the DS3 payload data. This prevents certain transport equipment from falsely reporting alarms.

Data Link

Set to **ENABLE** to allow for remote configuration. When enabled, the T3SU 300 provides a channel between the local and the remote DSU for point-to-point remote configuration.

Remote Auto-Configuration

This feature allows one T3SU 300 (set to **MASTER**) to automatically relay its DTE port bandwidth configuration to a second unit (set to **SLAVE**). If desired, the feature can be disabled by either unit.

DTE PORTS

The **DTE PORTS** menu allows you to select a port to configure. If **REMOTE ACCESS CONFIGURATION** is set to **MASTER** (**CONFIGURATION** -> **DS3 NETWORK** -> **REMOTE AUTO CONFIGURATION** -> **MASTER**), then a fifth option, **TIMED PROFILES**, is available. See *Figure 3-3*. This option allows you to set up timed profiles specifying bandwidth allocation for all four ports.

Configuration selections for the individual ports are described in the following section. A more in-depth description of **TIMED PROFILES** is on page 3-10.

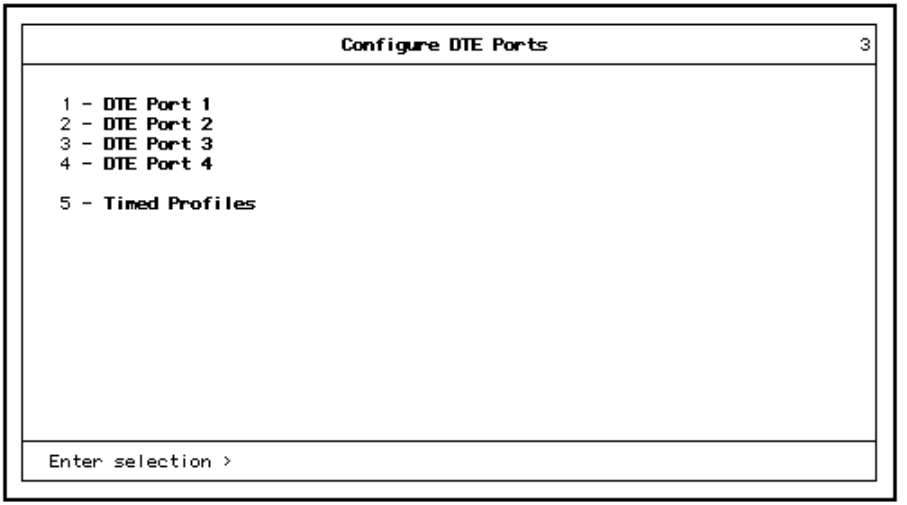


Figure 3-3. DTE Ports Menu

Port Selections 1-4

Select **DTE PORT 1**, **2**, **3**, or **4** to access the following port configuration parameters. Configure each DTE port to be compatible with the DTE equipment attached to it. A **PORT CONFIGURATION** menu example is shown in *Figure 3-4*. Descriptions of the individual fields follow the illustration.

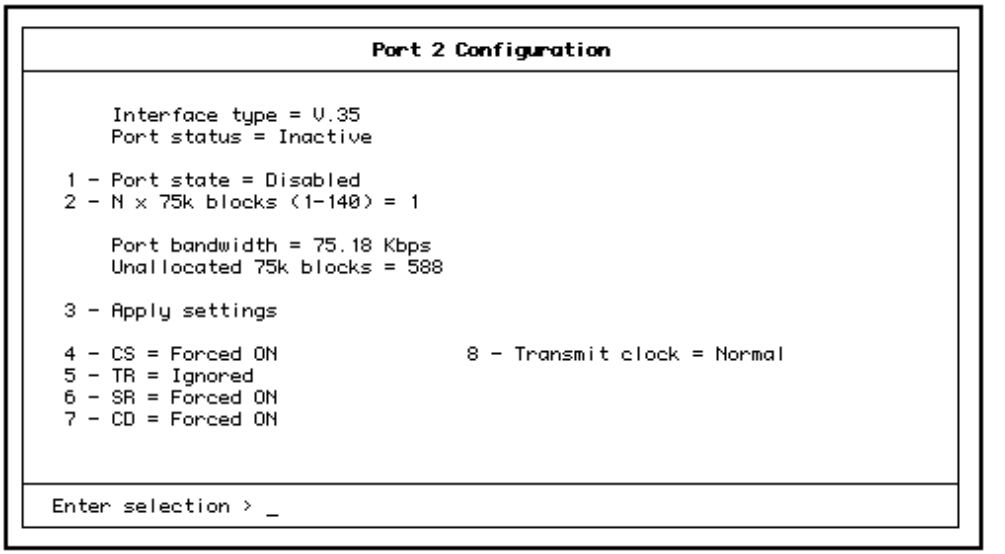


Figure 3-4. Port Configuration Menu (with V.35 interface card installed)

Interface Type

This read-only status field shows the interface type of the selected port (HSSI or V.35).

Port Status

This read-only status field displays one of the following messages to show the port status of the selected port:

Inactive
The port is installed, but idle. Activate a port through the **PORT STATE** field of this menu.

Active
The port has been configured and is passing data.

Waiting
The port has been configured and is waiting for the DTE to issue the appropriate handshaking signals. For the HSSI interface, the terminal equipment available (TA) signal must be asserted by the DTE. For V.35, DTR is required if the TR field in this menu is set to **IDLE WHEN OFF**; otherwise, DTR is ignored.

Error
An error condition such as loss of transmit clock has occurred.

Not Installed
An interface card is not installed in the selected port. If a port is not installed, the remainder of the **PORT CONFIGURATION** menu does not appear.

Port State

If a port is installed but not currently in use, set to **DISABLED**. Set to **ENABLED** to activate an installed port.

Nx75k Blocks

This field determines the amount of bandwidth allocated to the selected port. For a HSSI interface, the selections are from 1-588 (yielding a bandwidth of 75.2 kbps to 44.2 Mbps). For a V.35 interface, the selections are from 1-140 (yielding a bandwidth of 75.2 kbps to 10.5 Mbps). Changes to this field do not take effect until **APPLY SETTINGS** is selected.

Port Bandwidth

This read-only status field shows the amount of bandwidth that will be available if the selection made in the **NX75K BLOCKS** field is applied.

Unallocated 75k blocks

This read-only status field shows the number of 75k blocks of bandwidth not already allocated to the four ports.

Apply Settings

Select this field after making all configuration changes for the selected port. The changes are then applied to the unit immediately.

Applying the settings briefly affects all ports of the T3SU 300. You may cancel changes made to the current **PORT CONFIGURATION** menu by pressing the **ESC** key.

CS

Selects the control mode for the clear to send (CS) lead. This field only appears if a V.35 interface card is installed in the selected port.

Forced On
The CS lead remains on and request to send (RS) is ignored as long as the unit is synchronized and able to pass data.

Follow RS
The CS state matches the RS state.

TR

Selects the T3SU 300's response to the data terminal ready (TR) lead. This field only appears if a V.35 interface option card is installed in the selected port.

Ignored
The T3SU 300 ignores the state of the TR lead.

Idle When Off
The T3SU 300 suspends traffic on the selected port if the TR lead is off.

SR

Selects the control mode for the data set ready (SR) lead. This field only appears if a V.35 interface card is installed in the selected port.

Forced On
The SR control lead remains on regardless of the state of the network.

Off When OOS/OOF
The SR control lead remains on unless the T3SU 300 receives an out of service / out of frame (OOS / OOF) condition from the network.

Off When Test
The SR lead remains on except when the T3SU 300 is executing a test.

Off When OOS/OOF or Test

The SR lead remains on except when the unit receives an OOS/OOF condition from the network or when the unit is executing a test.

CD

Selects the control mode for the carrier detect (CD) lead. This field only appears if a V.35 interface card is installed in the selected port.

Forced On

The CD lead remains active at all times.

Off When OOS/OOF

The CD control lead remains on unless the T3SU 300 receives an OOS/OOF condition from the network.

Transmit Clock

Selects the source of the clock used to transfer data from the DTE to the T3SU 300. This selection is only available if a V.35 interface card is installed in the selected port. Use the following chart to determine your selection:

Select...	If...
Normal	you want the transmit clock to be derived from the T3SU 300.
Invert	your DTE device cannot provide a transmit clock signal and data errors are present between your DTE and the T3SU 300.
External	you are transmitting at high rates. This selection eliminates data errors caused by excessive delays in the DTE transmit clock receiver, transmit data driver, and cable length.

Selecting Normal or Invert clocking options depends on your DTE, cable length, and cable characteristics. To verify error free operation, perform a DTE loopback test and a BERT test from the DTE. See the chapter Diagnostics on page 6-1 for information on performing these tests.

Timed Profiles

Using this option, you can allocate bandwidth based on the time of day. For example, you can assign more bandwidth to the corporate LAN during business hours and more bandwidth to a backup machine in the evenings. The T3SU 300 can store two separate user profiles which have bandwidth selections for each of the four ports. See *Figure 3-5* and *Figure 3-6*.

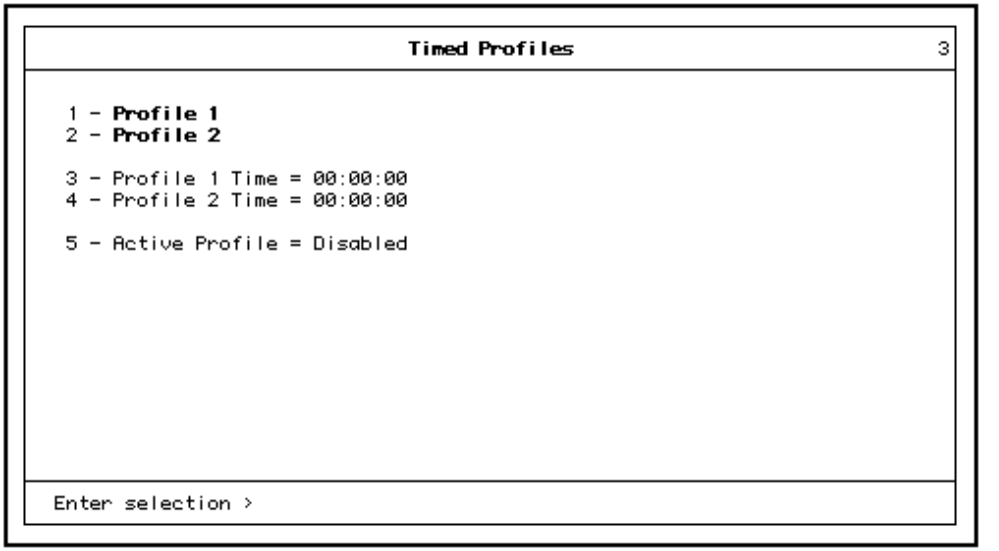


Figure 3-5. Timed Profiles Screen

Profiles 1 and 2

The **PROFILE CONFIGURATION** screens allow you to change the **PORT STATE** and **NX75K BLOCKS** options for all four ports. See page 3-7 for descriptions of these options. The settings are then assigned to

the selected profile (1 or 2) and apply whenever that profile is active. See *Figure 3-6*.

Profile Time (1 and 2)

Enter the time that you want the profile to become active. Enter the time in military time (i.e., 00:00:00 = 12 AM). The profile remains active until one of the following occurs: (1) the other profile's activation time comes about, or (2) the profile is disabled manually through the **ACTIVE PROFILE** selection.

Active Profile

Use this field to either manually force a profile to become active (regardless of the time of day) or to disable the profiles completely.

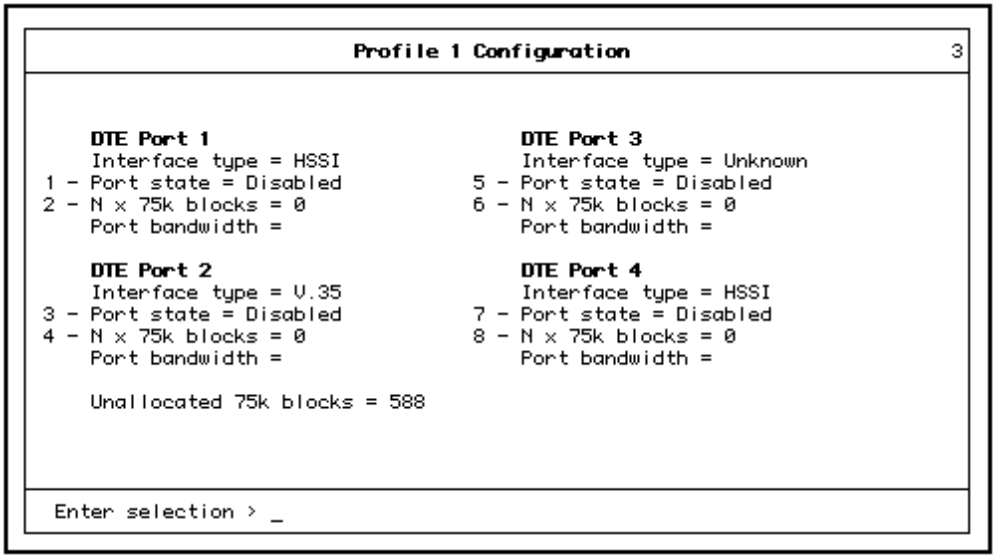


Figure 3-6. Example of a Profile Configuration Menu

SYSTEM MANAGEMENT

The **SYSTEM MANAGEMENT** menu allows you to configure the T3SU 300 for management through SNMP, TELNET, or a VT 100 interface. Embedded SNMP and TELNET are available through

either a SLIP / PPP or a 10baseT ethernet port. The **SYSTEM MANAGEMENT CONFIGURATION** menus are shown in *Figure 3-7* and *Figure 3-9*. Scroll between the two menus using the up and down arrows on your keyboard.

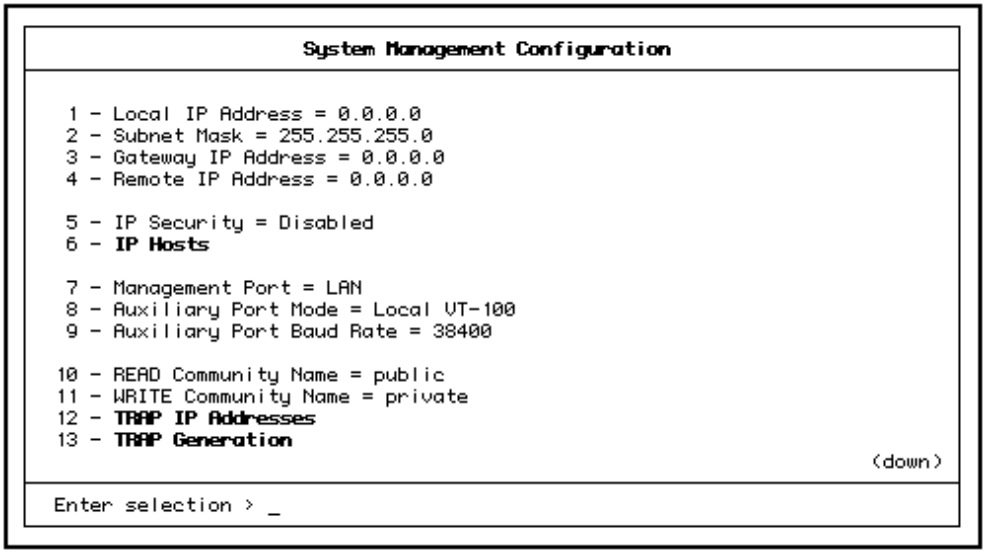


Figure 3-7. System Management Configuration Menu (1 of 2)

Local IP Address

Enter the T3SU 300 IP address. This IP address applies to the ethernet or auxiliary port (when configured for PPP or SLIP). This address is available from the network administrator.

Subnet Mask

Enter the subnet mask of the T3SU 300. This address is available from the network administrator.

Gateway IP Address

Enter the gateway IP address of the T3SU 300. This address is necessary only if the T3SU 300 and the network manager are connected through a gateway node. If an IP packet is to be sent to a different network, the unit sends it to the gateway.

Remote IP Address

Enter the remote T3SU 300's IP address to provide network management access through the local T3SU 300. See the section *Remote SNMP Management Application* on page 7-7 for more information.

IP Security

Enable or disable the IP Security option. If enabled, the unit accepts management commands and TELNET sessions from the IP addresses entered into the **IP HOSTS** fields.

IP Hosts

Enter up to 16 IP addresses of management stations from which the unit should accept management commands. These addresses are only applicable if **IP SECURITY** is enabled.

Management Port

Assign the management port to be either LAN, FDL (facility datalink), or the AUX Port.

Auxiliary Port Mode

This selection applies to version 1200217L1 only. Select the AUX port's function for your application. The AUX port, located on the rear panel of the T3SU 300, can communicate through a VT 100 compatible terminal, or a device running SLIP or PPP protocol (either through a direct connection or dialup through an external

modem). When set to PPP, SLIP, Dialup PPP, or Dialup SLIP, the ethernet port is disabled. If you select any of the dialup options, an additional menu item (**DIALUP OPTIONS**) appears on the second **SYSTEM MANAGEMENT CONFIGURATION** screen. See *Figure 3-10*. The **DIALUP OPTIONS** are described on page 3-19.

Selections for **AUXILIARY PORT MODE** include local and dialup options for VT 100, PPP, and SLIP. If **MANAGEMENT PORT** (see page 3-13) is set to **AUX PORT**, the **DIALUP OPTIONS** are available.

Modem Mode

This selection applies to version 1200217L2 only. Select the **AUX** port function for your application. The **AUX** port, located on the rear panel of the T3SU 300, provides a telephone line (POTS) for connecting to the internal V.34 modem. The modem interface can be configured for dial-in service in VT 100, SLIP, and PPP modes. In addition, the T3SU 300 is capable of dial-out operation to report error conditions. All modem options can be configured in the **DIALUP OPTIONS** menu located on the second **SYSTEM MANAGEMENT CONFIGURATION** screen. See *Figure 3-9*. The **DIALUP OPTIONS** are described on page 3-19.

Selections for the **MODEM MODE** include dialup options for VT 100, PPP, and SLIP. If the **MANAGEMENT PORT** option (see page 3-13) is set to **AUX PORT**, the **PPP** and **SLIP** options are available.

Auxiliary Port Baud Rate

Set the operating speed of the **AUX** port to match the connected device. The selections are 1200, 2400, 4800, 9600, 19200, and 38400 bps.

Read Community Name

Enter the authentication strings used for SNMP management. Match the T3SU 300 to the SNMP manager for read privileges.

Write Community Name

Enter the authentication strings used for SNMP management. Match the T3SU 300 to the SNMP manager for write privileges.

Trap IP Addresses

Enter up to five IP addresses of SNMP managers to which the T3SU 300 sends traps.

Trap Generation

This selection determines which trap types (if any) are generated by the unit. Use this menu to enable or disable **NEAR END ALARM**, **FAR END ALARM**, **MIB II STANDARD**, **NETWORK TEST**, and **DTE PORT** trap types. See *Table 3-1* on page 3-16 through *Table 3-5* on page 3-18 (following *Figure 3-8*) for trap descriptions.

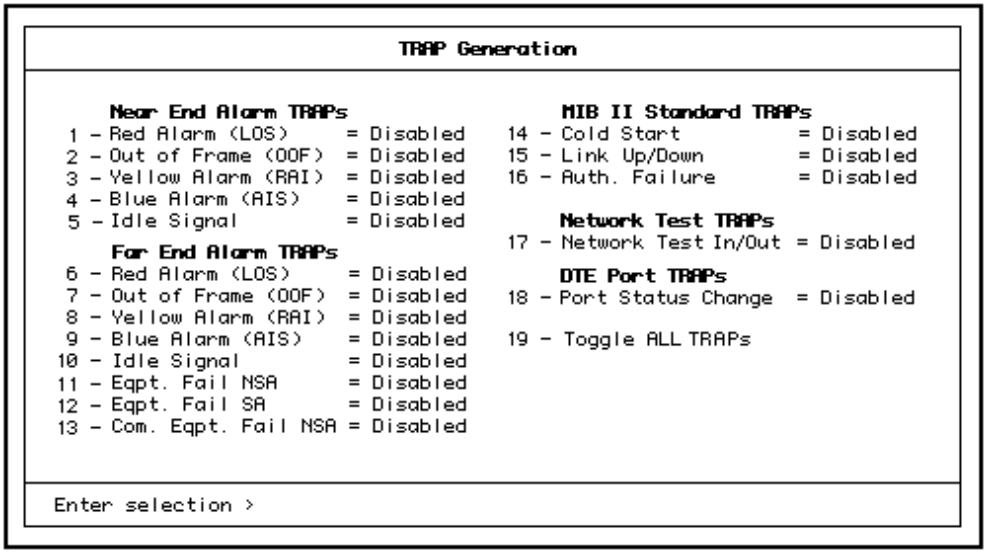


Figure 3-8. Trap Generation Menu

Table 3-1. Near End Alarm Trap Descriptions

Trap Type	If ENABLED, this trap is sent...
Red Alarm (LOS)	when the unit detects a loss of signal.
Out of Frame (OOF)	when the unit detects an out of frame condition.
Yellow Alarm (RAI)	when the unit detects an incoming RAI signal.
Blue Alarm (AIS)	when the unit detects an incoming AIS signal.
Idle Signal	when the unit detects an incoming idle signal (1100) over the entire DS3 bandwidth.

Table 3-2. Far End Alarm Trap Descriptions

Trap Type	If ENABLED, this trap is sent...
Red Alarm (LOS)	when the unit receives indication from the far end unit through the FEAC channel that the far end unit has lost its receive signal.
Out of Frame (OOF)	when the unit receives indication from the far end unit through the FEAC channel that the far end unit has lost frame synchronization with the network.
Yellow Alarm (RAI)	when the unit receives indication from the far end unit through the FEAC channel that the far end unit is receiving an RAI indication from the network.
Blue Alarm (AIS)	when the unit receives indication from the far end unit through the FEAC channel that the far end unit is receiving an AIS indication from the network.

Trap Type	If ENABLED, this trap is sent...
Idle Signal	when the unit receives indication from the far end unit through the FEAC channel that the far end unit is receiving an idle signal (1100) over the entire DS3 payload.
Eqpt. Fail NSA	when the unit receives indication from the network through the FEAC channel of a non-service-affecting failure in the network equipment.
Eqpt. Fail SA	when the unit receives indication from the network through the FEAC channel of a service-affecting failure in the network equipment.
Com. Eqpt. Fail NSA	when the unit receives indication from the network through the FEAC channel of a non-service-affecting failure in the network common equipment.

Table 3-3. MIB II Standard Trap Descriptions

Trap Type	If ENABLED, this trap is sent...
Cold Start	when the unit is first powered on.
Link Up	when the network recovers from a Link Down condition and data transmission is restored.
Link Down	when a network condition prevents data transmission. This could be either an alarm or a network test.
Auth. Failure	when an SNMP request is made with the wrong read or write community names.

Table 3-4. Network Test Trap Descriptions

Trap Type	If ENABLED, this trap is sent...
Network Test In	when the unit goes into a DS3 network test, either commanded locally or remotely.
Network Test Out	when the unit is in a DS3 network test and the test is terminated.

Table 3-5. DTE Port Trap Description

Trap Type	If ENABLED, this trap is sent...
Port Status Change	when the unit detects a change in any of the four DTE ports. These traps may be generated when a DTE interface card is plugged in, a cord is removed, a port is reconfigured, a port goes into an error condition due to cabling problems, or a port goes into a test mode.

Toggle All Traps

When activated, this entry allows you to toggle ALL alarms (previously described) between their disabled and enabled states.

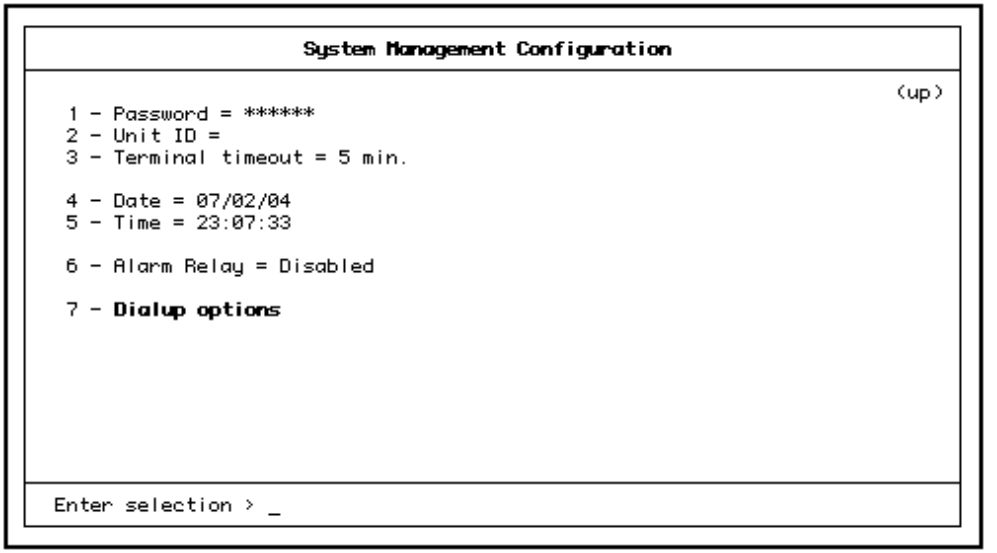


Figure 3-9. System Management Configuration Menu (2 of 2)

Password

Set the password required at login (up to 32 characters). The default password is **adtran**.

Unit ID

Enter a name to identify the unit for management purposes.

Terminal Timeout

Set the amount of time the terminal or TELNET session can remain inactive before requiring re-entry of the password for access. This option can be disabled or set for 1 minute, 5 minutes, 15 minutes, 60 minutes, or one day.

Date/Time

Enter date and time information. Enter the time in military time (separated by colons). Enter the month, date, and year (separated by forward slashes). View this information in the **STATISTICS** menus.

Alarm Relay

Enable if the alarm terminal block (located on the rear of the unit) is connected to an audible alarm. If enabled, the alarm circuit is activated when a network alarm occurs.

Dialup Options

Configure the dialup capabilities of the T3SU 300. For product version 1200217L1, this option is only available if a dialup selection was made for the **AUXILIARY PORT MODE** (described on page 3-13). For product version 1200217L2, this option is always available. See *Figure 3-10*. Descriptions of the individual fields of this menu follow the figure.

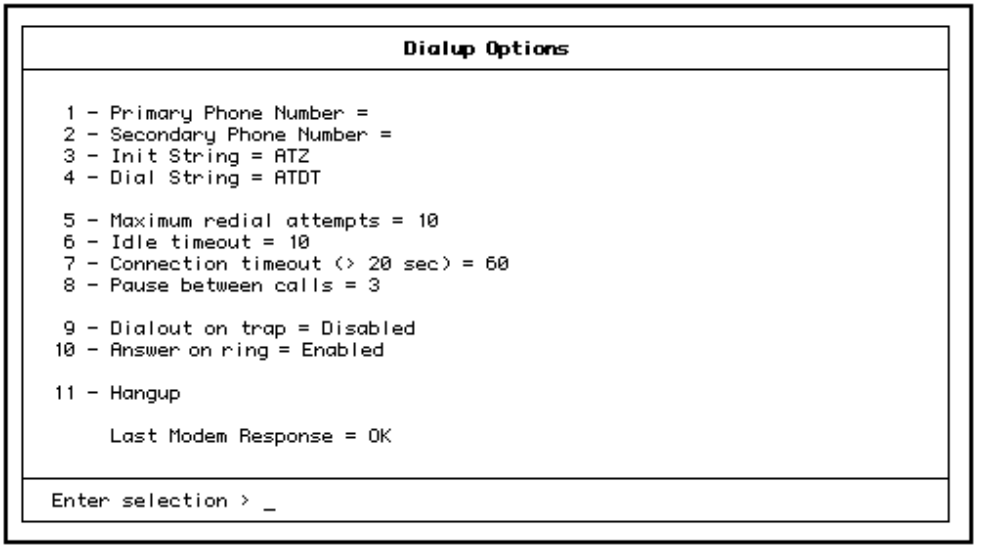


Figure 3-10. Dialup Options Menu

Primary and Secondary Phone Numbers

When the T3SU 300 dials out to send a trap, it first dials the **PRIMARY PHONE NUMBER**. If the call is unsuccessful, it tries the **SECONDARY PHONE NUMBER**. Attempts between the two numbers continue until a call is established and the trap is reported (or until each number's maximum for redial attempts is reached).

Initializing String

The AT command entered in this field is used to initialize the modem. Normally, this field should be left at the default setting (ATZ).

Dial String

The AT command entered in this field causes the modem to dial out. Normally, this field should be left at the default setting (ATDT).

Maximum Redial Attempts

The T3SU 300 attempts to establish a call the number of times entered in this field. If a successful call is not established after the final attempt, the T3SU 300 discards the trap messages.

Idle Timeout

Once a call is established and the trap messages are sent, the T3SU 300 remains online for the amount of seconds entered in this field. If the field is set to 0, the unit hangs up as soon as the trap is sent.

Connection Timeout

The T3SU 300 waits for a connection the amount of seconds entered in this field. Timing begins as soon as the dial command is issued.

Pause Between Calls

The T3SU 300 waits the number of seconds entered in this field between redial attempts.

Dialout On Trap

Enable or disable the T3SU 300's ability to dial out to report traps. When the **AUXILIARY PORT MODE** (product version 1200217L1) or **MODEM MODE** (product version 1200217L2) is configured for **DIALUP VT 100**, the unit reports error conditions in plain ASCII with the following information:

- The Unit ID value programmed in the Unit ID field of the second **SYSTEM MANAGEMENT** screen (see *Figure 3-9*)
- A trap code indicating the error condition (selected from the **TRAP GENERATION** screen under **SYSTEM MANAGEMENT**)
- The date and time when the error was logged

When the **AUXILIARY PORT MODE** or **MODEM MODE** is configured for **DIALUP PPP** or **DIALUP SLIP**, the unit logs in to the PPP / SLIP host and reports the error conditions to the hosts designated under the **TRAP IP ADDRESSES** (also found under **SYSTEM MANAGEMENT**).

Answer on Ring

Enable or disable the T3SU 300's ability to accept an incoming call. If enabled, incoming calls are automatically answered by the T3SU 300, allowing you to remotely perform management functions.

Hangup

Selecting this option forces the T3SU 300 to end an established call.

Last Modem Response

This status field displays the last modem response to the T3SU 300. Possible responses include:

OK
CONNECT
BUSY
ERROR
NO DIALTONE
NO CARRIER

UTILITIES

The **UTILITIES** menu allows you to view T3SU 300 system information (including self test results), revert to default configuration settings, or flash load a new version of software. The **UPDATE FLASH SOFTWARE** selection is only applicable when configuring the unit locally. The **SYSTEM UTILITIES** menu is shown in *Figure 3-11*. Possible results for the self test are listed in the following table

If the self test results are...	Then...
PASS	the self test was successful and the unit is ready to use.
BAD RAM DATA BAD RAM ADDRESS BAD CHECKSUM BAD BOOT SECTOR DS3F LOOPBACK FAILURE ARTE TERMINAL LOOPBACK FAILURE or ARTE INTERNAL LOOPBACK FAILURE	contact ADTRAN Technical Support. See the inside back cover of this manual for more information.
CONFIGURATION CORRUPT	select **SAVE CONFIGURATION** from the main **CONFIGURATION** menu. If condition persists, contact ADTRAN Technical Support.

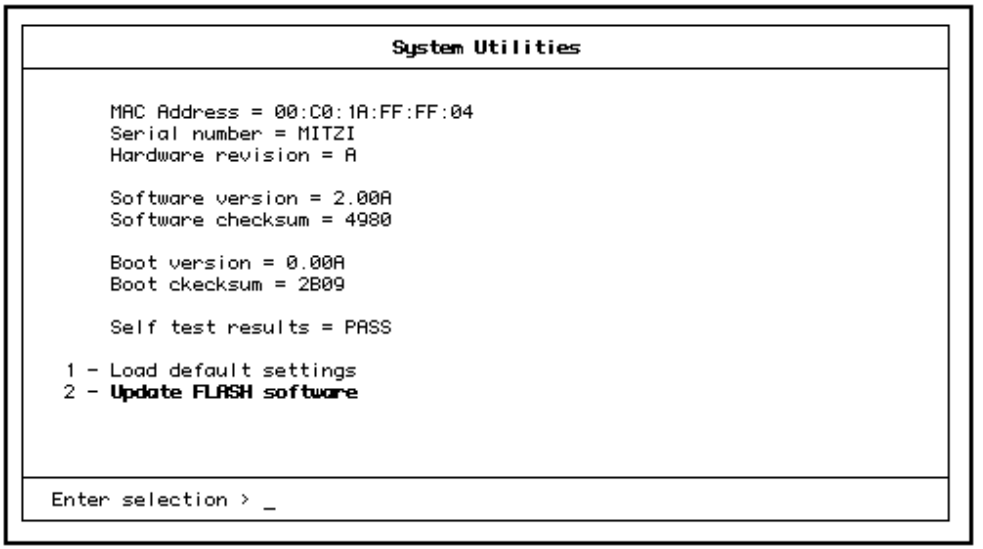


Figure 3-11. System Utilities Menu

SAVE CONFIGURATION

The **SAVE CONFIGURATION** selection commits the current configuration changes to nonvolatile memory. If this option is not selected after making changes to the configuration, the unit reverts to its previous configuration when powered down.

Chapter 4 Status

View port status information by selecting **1 STATUS** from the **MAIN** menu. Information for the network port and the DTE ports is provided. The **STATUS** menu is shown in *Figure 4-1*.

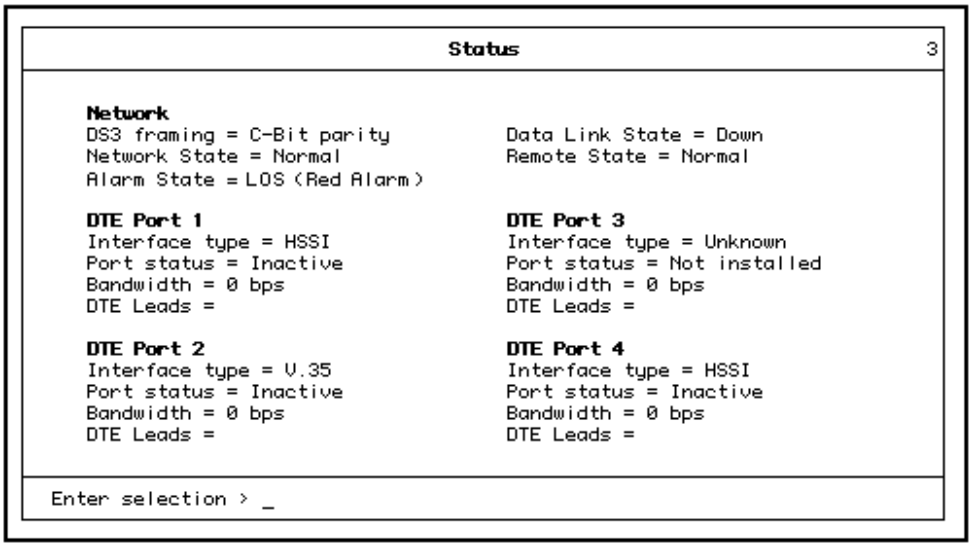


Figure 4-1. Status Menu

NETWORK PORT

DS3 Framing

The DS3 framing type is shown in this field.

Network State

This field displays the current condition of the network. Possible conditions are listed in the following table:

Condition	Description
Normal	The T3SU 300 is ready to pass data.
Alarm	The unit is currently receiving an alarm indication. See the **RECEIVE ALARM** field in this menu to determine the alarm type.
In Test	The unit is currently in test mode. The **DIAGNOSTICS** menu provides information on test type.

Alarm State

This field displays the current alarm condition of the T3SU 300. Possible conditions are given in the following table:

Condition	Description
Normal	No alarms are currently being received.
Yellow	The unit is transmitting a yellow alarm from the network. This alarm is a signal sent back toward the source of a failed transmit circuit. The X-bits (X1 and X2) are set to zero.
LOS (Red Alarm)	The unit has lost the Rx signal.

Condition	Description
Blue (AIS)	The unit is receiving a blue alarm condition from the network. A blue alarm occurs when consecutive 1010s are received in the information bits. This indicates that there is a transmission fault located either at or upstream from the transmitting terminal.
OOF	The unit detects an out of frame condition from the network.
Idle	The unit detects an idle sequence from the network. Service is immediately available for use.

Data Link State

This field displays the current state of the data link between the local and the remote T3SU 300s. Possible states are listed in the following table:

Condition	Description
Normal	The local unit's data link is in sync with the remote unit.
Disabled	The **DATA LINK** option in the **DS3 NETWORK CONFIGURATION** menu is set to **DISABLED**.
Down	The local and remote units are not in sync.

Remote State

This field displays the current state of the remote link. Possible states are listed in the following table:

Condition	Description
Normal	No alarms are currently being received.
RAI (Yellow Alarm)	The unit is transmitting a yellow alarm from the network. This alarm is a signal sent back toward the source of a failed transmit circuit. The X-bits (X1 and X2) are set to zero.
LOS (Red Alarm)	The unit has lost the Rx signal.
AIS (Blue Alarm)	The unit is receiving a blue alarm condition from the network. A blue alarm occurs when consecutive 1010s are received in the information bits. This indicates that there is a transmission fault located either at or upstream from the transmitting terminal.
OOF	The unit detects an out of frame condition from the network.
Idle	The unit detects an idle sequence from the network. Service is immediately available for use.
Eqpt Fail (SA)	The network has signaled a service affecting equipment failure condition.
Eqpt Fail (NSA)	The network has signaled a non-service affecting equipment failure condition.
Com Eqpt Fail (NSA)	The network has signaled a non-service affecting common equipment failure condition.
Unknown	The T3SU 300 is unable to determine the state of the network or the remote unit.

DTE PORTS

The following status information is available for DTE Ports 1-4.

Interface Type

The interface type of the port is shown in this field (HSSI or V.35).

Port Status

This field displays the current port status. Possible states are listed in the following table:

Condition	Description
Inactive	The port is installed, but idle. Activate a port through the **PORT STATE** field of the **DTE PORT CONFIGURATION** menu.
Active	The port has been configured and is passing data.
Error	An error condition such as loss of transmit clock has occurred.
In Test	The unit is currently in test mode.
Waiting for DTE	The port has been configured and is waiting for the DTE to issue the appropriate handshaking signals. For the HSSI interface, the terminal equipment available (TA) signal must be asserted by the DTE. For V.35, DTR is required if the TR field is set to **IDLE WHEN OFF**; otherwise, DTR is ignored. The TR field is found in the **DTE PORT CONFIGURATION** menu.

Bandwidth

Displays the amount of bandwidth currently being used by the port.

DTE Leads

If a lead is active on the port, it is displayed in this field. The leads differ according to the interface type. Lead descriptions for both the HSSI and the V.35 interfaces follow.

HSSI Interface Leads	Condition
TA (terminal available)	Asserted by the DTE to indicate readiness to transmit data.
CA (communications equipment available)	Asserted by the T3SU 300 to indicate readiness to transmit data.
LA (loopback circuit A)	The condition reflected by this lead is dependent upon the LB lead. See Table *4-1* on page 4-7.
LB (loopback circuit B)	The condition reflected by this lead is dependent upon the LA lead. See Table *4-1* on page 4-7.
LC (loopback circuit C)	Asserted by the unit to request a loopback from the DTE.
TM (test mode)	Asserted by the T3SU 300 when either the network or the port is being tested.

Both TA and CA must be on before data will flow.

Table 4-1. LA and LB Leads

LA	LB	Condition
Off	Off	No test (normal)
On	Off	Local line loopback
Off	On	Remote line loopback
On	On	Local DTE loopback

V.35 Interface Leads

RS: Request to send
CS: Clear to send
CD: Carrier detect
TR: Data terminal ready
SR: Data set ready
LL: Local DTE port loopback
RL: Remote port payload loopback
TM: Test mode. Asserted by the T3SU 300 when either the network or the port is being tested.

Chapter 5 Statistics

VIEWING STATISTICAL INFORMATION

Select **2 STATISTICS** from the **MAIN** menu to access **STATISTICS** menus. Alarm information and performance parameters are available for both the near and far ends of the network. Statistical information is given in screens based on the following time periods: the current 15-minute interval, a 24-hour history (divided into 96 15-minute intervals), and the totals for the previous 24 hours. Also, a cumulative alarm count is given. This count continues indefinitely until reset by the user. See *Figure 5-1* for the main **LOCAL STATISTICS** screen.

*If the Datalink option is disabled, remote statistics are not available (***CONFIGURATION** -> **DS3 NETWORK** -> **DATA LINK***).*

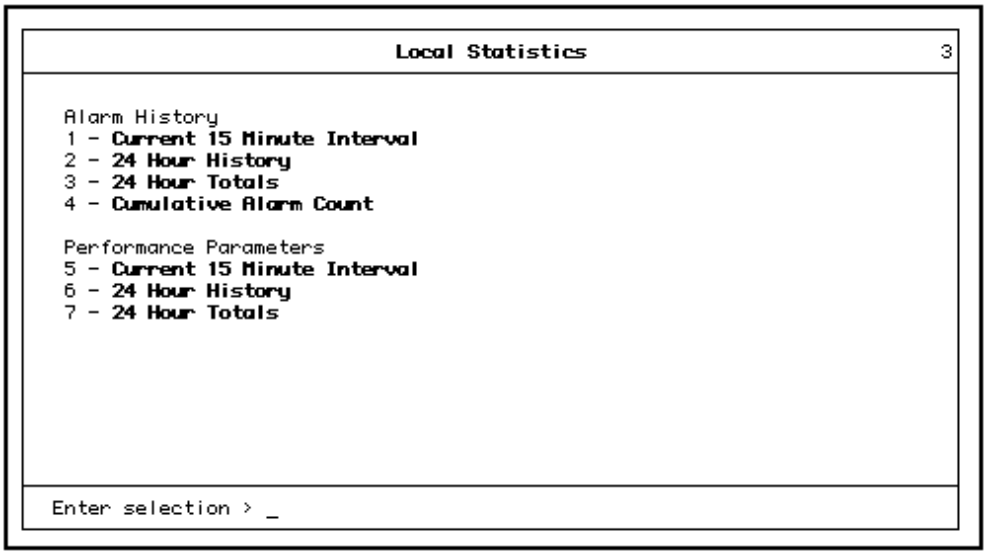


Figure 5-1. Main Local Statistics Menu Screen

Alarm History

The T3SU 300 keeps track of yellow, blue, and red alarms for the near end. View alarm history information in one of the three time period selections, or view a cumulative alarm count. Information in these fields is for the given time period (if any) since the last reset. The cumulative alarm count continues indefinitely until **CLEAR ALL LOCAL STATISTICS** is selected. See *Figure 5-2* and *Figure 5-3* for examples of alarm history screens.

The count given reflects the number of times the alarm has occurred (rather than the number of seconds the alarm was active).

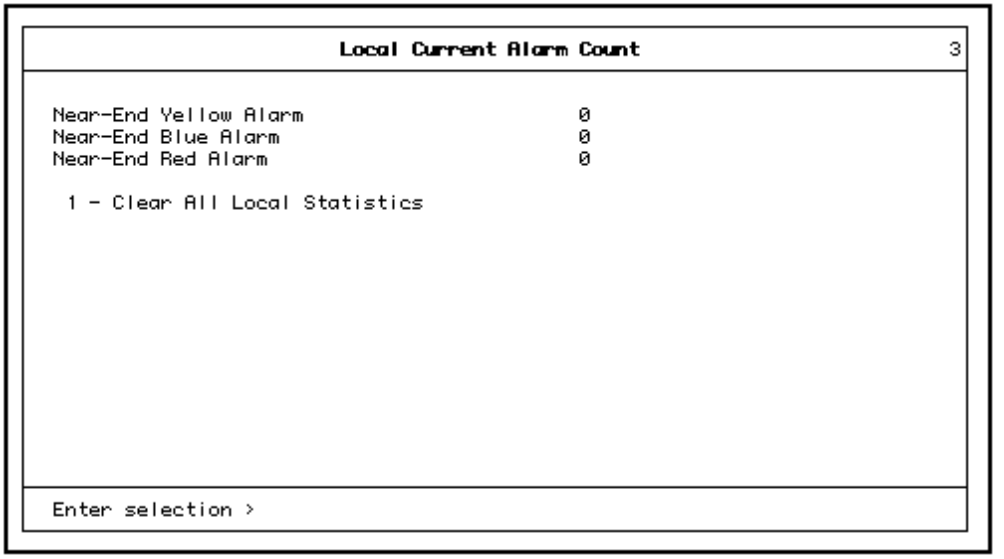


Figure 5-2. Current Alarm Count Screen

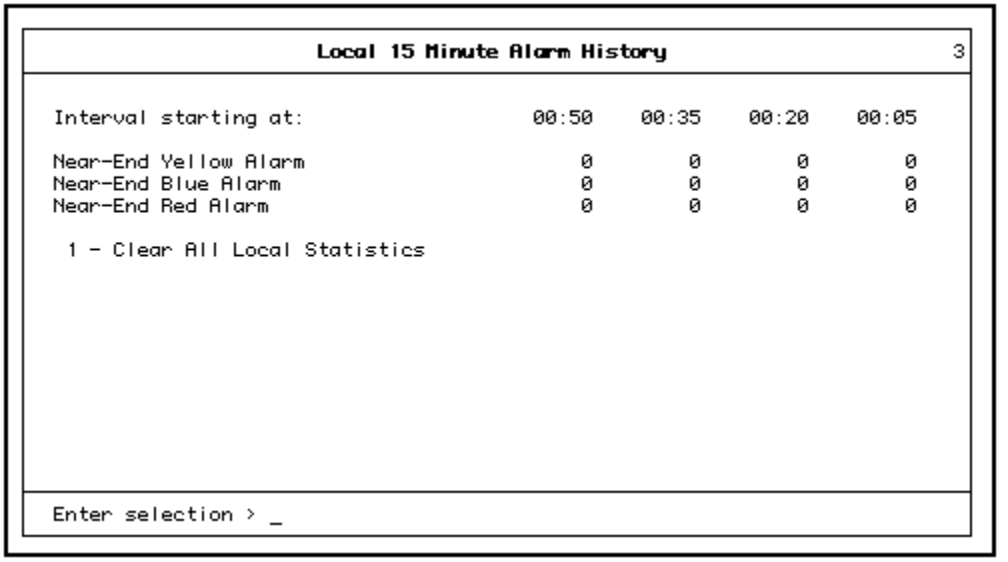


Figure 5-3. 24-Hour Alarm History Screen

Performance Parameters

View performance parameter information in one of the three time period selections. Information in these fields is for the given time period since the last reset. When viewing the 24-hour history statistics screen, use the left and right arrow keys to scroll through all 96 15-minute intervals. See *Figure 5-4* through *Figure 5-6* for examples of the performance parameter screens.

Descriptions of each field of these screens follow:

Interval starting at:
Time that the 15-minute interval began. This field is only displayed in the 24-hour history screen which gives information for the previous 24 hours divided into 15-minute intervals (shown in *Figure 5-3*).

Unavailable Seconds (UAS)
Time in seconds that the network port is unavailable for data delivery. This means that the T3 link is down or in test, or that the signaling state is down.

Severely Errored Framing Seconds (SEFS)
Number of seconds with one or more out of frame defects or a detected incoming AIS.

Line Coding Violations (LCV)
Number of BPVs (bipolar violations) and EXZs (excessive zeros) that have occurred.

Line Errored Seconds (LES)
Number of seconds in which one or more CVs or one or more LOS (loss of signal) defects occurred.

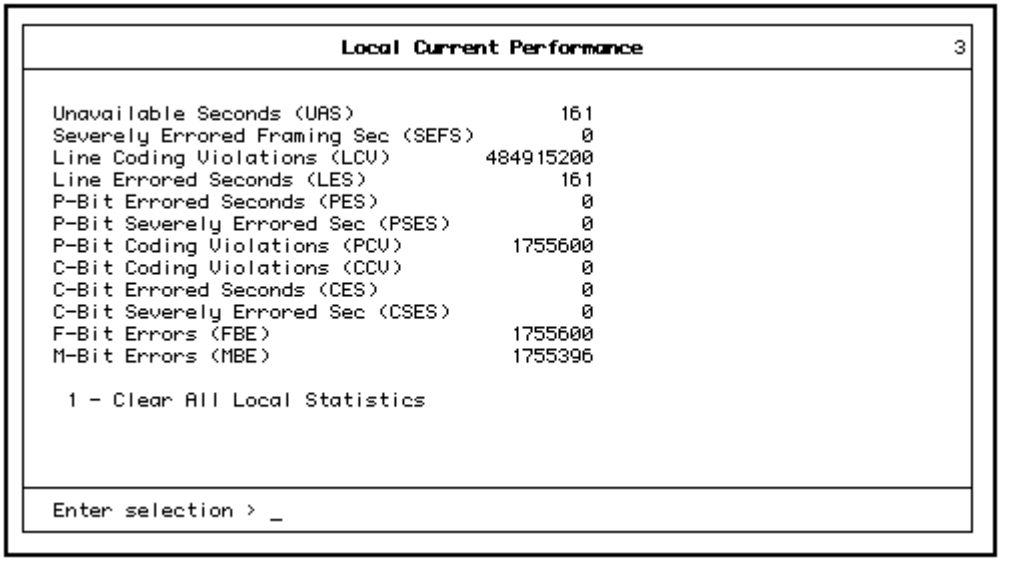


Figure 5-4. Network Statistics Menu for Current 15-Minute Interval

P-Bit Errored Seconds (PES)

Number of seconds with one or more PCVs (P-bit coding violations), one or more out of frame defects, or a detected incoming AIS (alarm indication signal). This count is not incremented when UASs (unavailable seconds) are counted.

P-Bit Severely Errored Seconds (PSES)

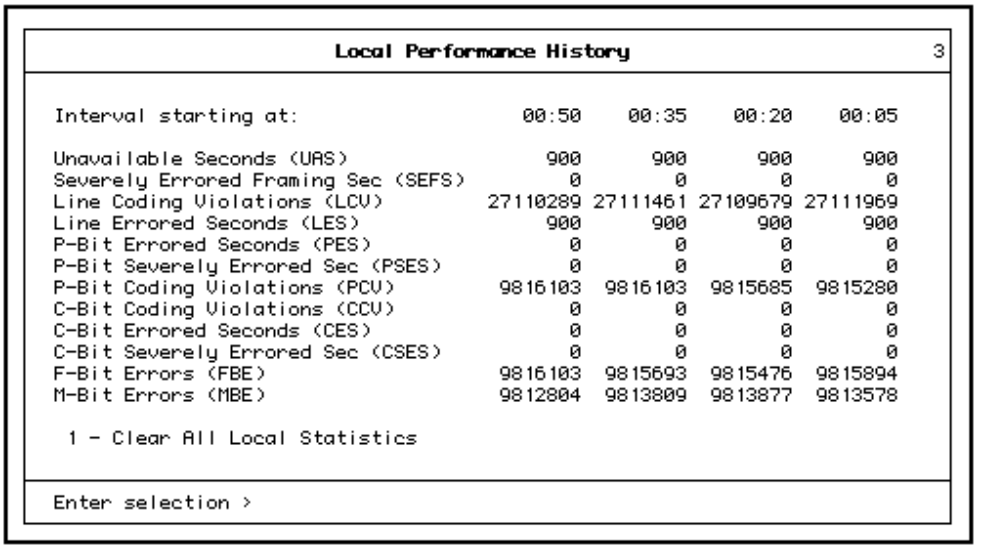
Number of seconds with 44 or more PCVs, one or more out of frame defects, or a detected incoming AIS. This count is not incremented when UASs are counted.

P-Bit Coding Violations (PCV)

Number of coding violation (CV) error events that have occurred.

C-Bit Coding Violations (CCV)

In C-bit parity mode, this is a count of coding violations reported via the C-bits or the number of C-bit parity errors that have occurred.



Local Performance History 3

Interval starting at:	00:50	00:35	00:20	00:05
Unavailable Seconds (UAS)	900	900	900	900
Severely Errored Framing Sec (SEFS)	0	0	0	0
Line Coding Violations (LCV)	27110289	27111461	27109679	27111969
Line Errored Seconds (LES)	900	900	900	900
P-Bit Errored Seconds (PES)	0	0	0	0
P-Bit Severely Errored Sec (PSES)	0	0	0	0
P-Bit Coding Violations (PCV)	9816103	9816103	9815685	9815280
C-Bit Coding Violations (CCV)	0	0	0	0
C-Bit Errored Seconds (CES)	0	0	0	0
C-Bit Severely Errored Sec (CSES)	0	0	0	0
F-Bit Errors (FBE)	9816103	9815693	9815476	9815894
M-Bit Errors (MBE)	9812804	9813809	9813877	9813578

1 - Clear All Local Statistics

Enter selection >

Figure 5-5. Network Port Statistics 24-Hour History Screen

C-Bit Errored Seconds (CES)
Number of seconds with one or more CCVs, one or more out of frame defects, or a detected incoming AIS. This count is not incremented when UASs are counted.

C-Bit Severely Errored Seconds (CSES)
Number of seconds with 44 or more CCVs, one or more out of frame defects, or a detected incoming AIS. This count is not incremented when UASs are counted.

F-Bit Errors (FBE)
Number of times an F-bit framing error has occurred.

M-Bit Errors (MBE)
Number of times an M-bit framing error has occurred.

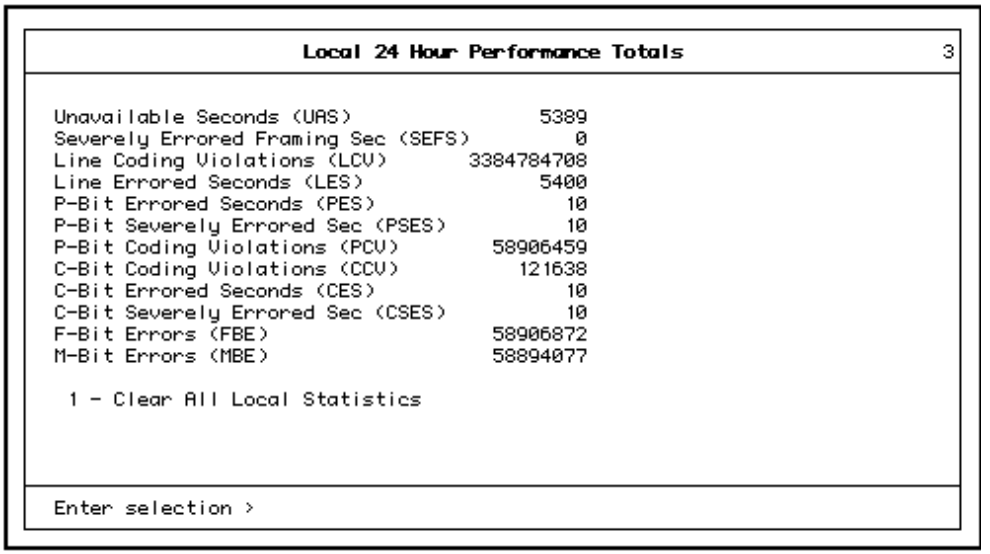


Figure 5-6. Network Port Statistics Menu (24-Hour Totals)

Clear All Local Statistics/Refresh All Remote Statistics

Clears or refreshes all current information. These selections affect all statistical information (not just the displayed screen).

Chapter 6 Diagnostics

The **DIAGNOSTICS** menu allows you to initiate loopback and BERT tests from the T3SU 300. *Figure 6-1* shows the main **DIAGNOSTICS** menu. Tests can be performed for the entire DS3 or for an individual DTE port. To choose a port from the left column of the menu, select the port's corresponding number and press **Enter** . The individual port menus provide loopback and BERT selections. BERT configuration options and results are given in the right column of the main **DIAGNOSTICS** menu. Diagnostic selections are described in the following sections.

You can only perform a BERT test on one port at a time. If a BERT test is already in progress and a second BERT test is selected for another port, the first test is discontinued.

Loopback tests may be performed simultaneously on all ports.

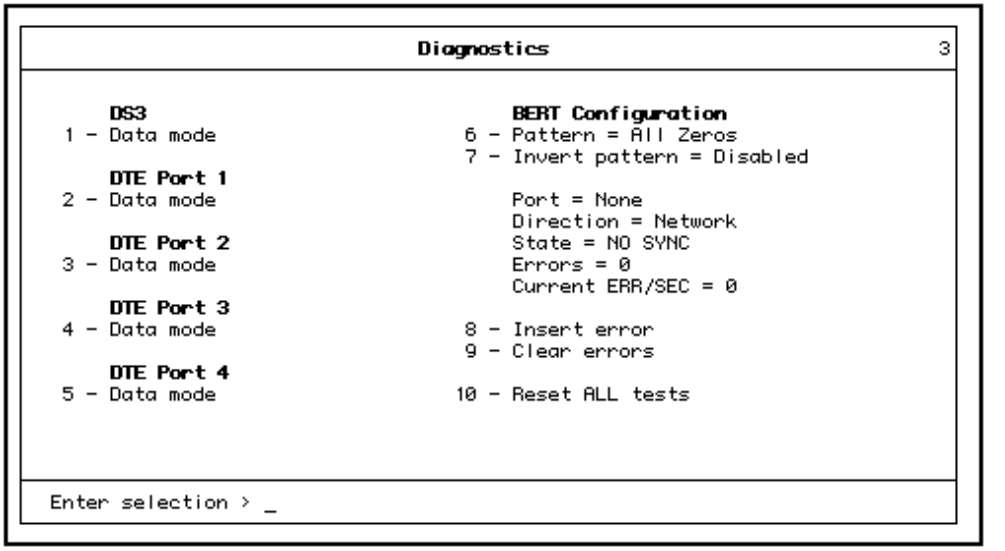


Figure 6-1. Diagnostics Main Menu

DS3

Access the DS3's diagnostic options by selecting **1** from the main **DIAGNOSTICS** menu. The menu in *Figure 6-2* appears.

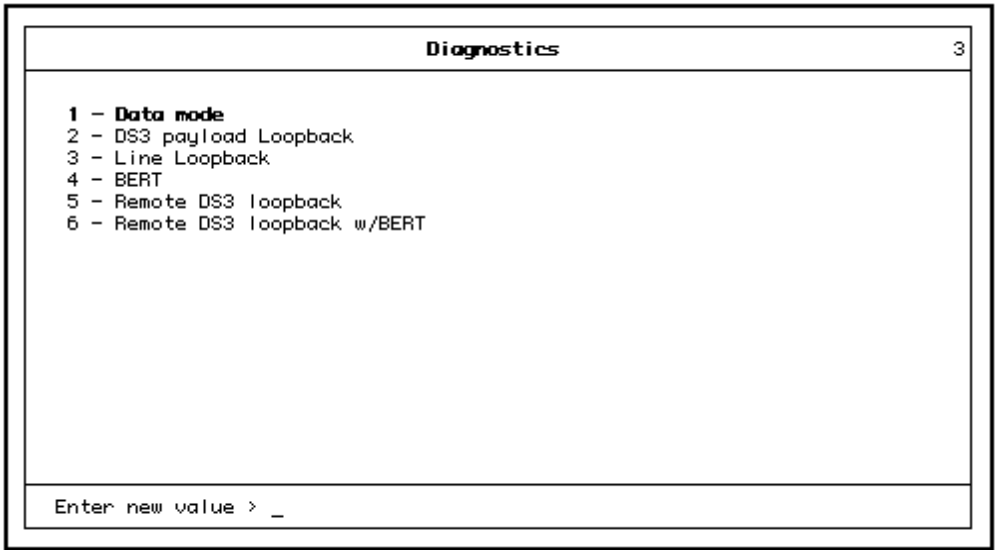


Figure 6-2. DS3 Diagnostics Menu

Data Mode

Ends a test already in progress for this port.

DS3 Payload Loopback

During this test, all payload information is re-framed and looped back towards the network. See *Figure 6-3* for a block diagram illustrating the loopback point and the signal paths for this test.

NOTE

This test does not interrupt data flow from the network to the DTE, but it does block all DTE-to-network data.

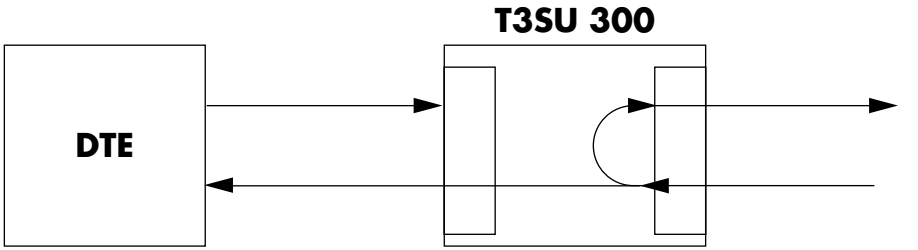


Figure 6-3. DS3 Payload Loopback Test

Line Loopback

This test allows the loop interface (LINE) section of the local T3SU 300 to be tested from the remote T3SU 300 over the actual T3 circuit. Testing from the remote end of the circuit is performed by using a 511 test pattern or DTE data generated by the remote host. With this test, the T3SU 300 transceiver receives data from the network and loops it back toward the network through its transmitter. The transmitted data is identical to the receive data (including framing errors) and can therefore be accurately tested by the carrier for errors. See *Figure 6-4*.

NOTE

*The Line Loopback test is only available in loop timed mode (**CONFIGURATION** -> **DS3 NETWORK** -> **DS3 TIMING** -> **LOOP**).*

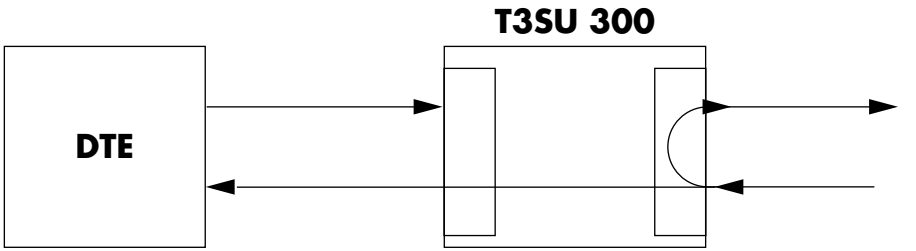


Figure 6-4. Line Loopback Test

BERT

Select BERT to perform a bit error rate test over the entire payload bandwidth. Only one BERT test may be performed at a time.

Remote DS3 Loopback

This selection initiates a DS3 Loopback test for the remote unit. DS3 Loopback tests are described previously on page 6-3.

Remote Loopback with BERT

This selection initiates a DS3 Loopback test for the remote unit and sends/checks the BERT pattern over the entire DS3 payload bandwidth.

DTE Ports 1-4

Access the DTE port diagnostic options by selecting the number corresponding with the desired port (2 through 5) from the main **DIAGNOSTICS** menu. The menu in *Figure 6-5* appears.

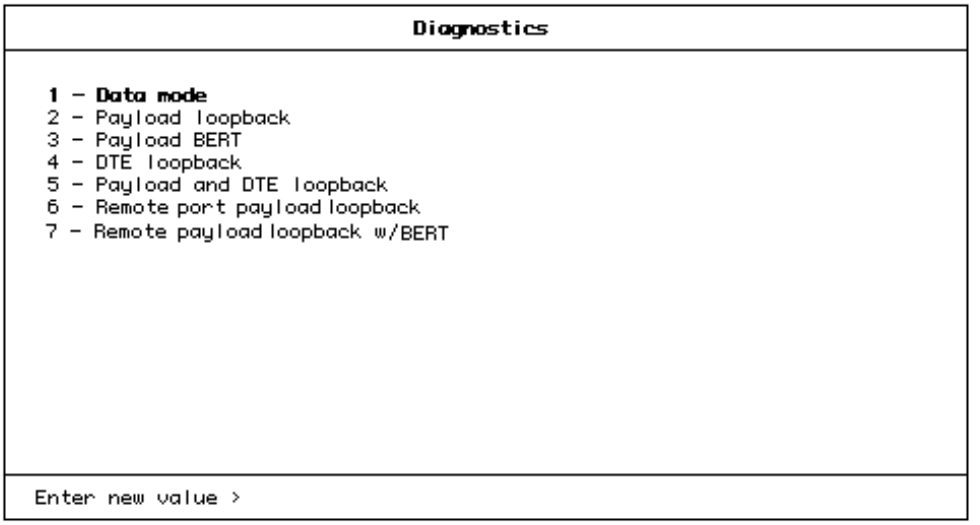


Figure 6-5. DTE Port Diagnostics Menu

Data Mode

Ends a test already in progress.

Payload Loopback

This selection initiates a Payload Loopback test for all data on the selected port rather than for the entire DS3. During this test, the data is looped back in the network direction. Perform this test to verify the integrity of the portion of the DS3 link connecting the selected port of the T3SU 300 and the remote DTE. This test is non-intrusive to the three other ports. See *Figure 6-6.*

NOTE

This test does not interrupt data flow from the network to the DTE, but it does block all DTE-to-network data for the selected port.

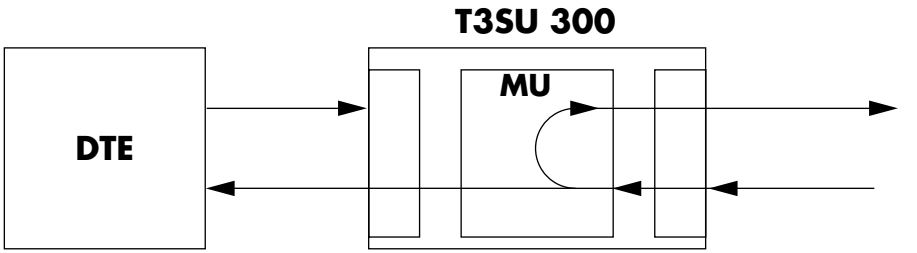


Figure 6-6. Payload Loopback Test

Payload BERT

This selection performs a bit error rate test on the selected port. This test in non-intrusive to the other three ports. Only one BERT test may be performed at a time. This test is normally performed from the remote and local ends simultaneously to determine whether the errors are coming from the transmit or the receive direction. See *Figure 6-7.*

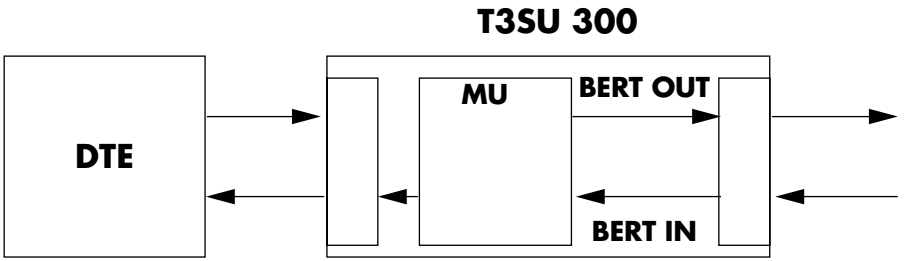


Figure 6-7. Payload BERT Test

DTE Loopback

This test is used to verify proper operation of the link between the T3SU 300 and the terminal equipment. During this test, all data sent by the terminal equipment is looped back to the terminal equipment. A block diagram illustrating the loopback point and the signal path is shown in *Figure 6-8*.

NOTE

While in DTE Loopback, data from the host is transmitted into the network.

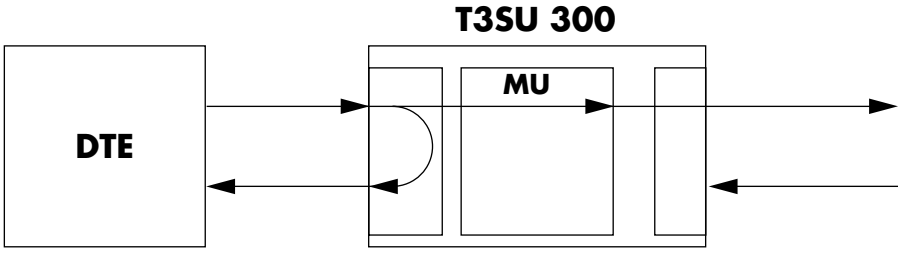


Figure 6-8. DTE Loopback Test

Payload and DTE Loopback

Select this test to perform payload and DTE loopbacks simultaneously. The individual tests are described previously on page 6-3 and page 6-7. See *Figure 6-9* for a block diagram illustrating this test.

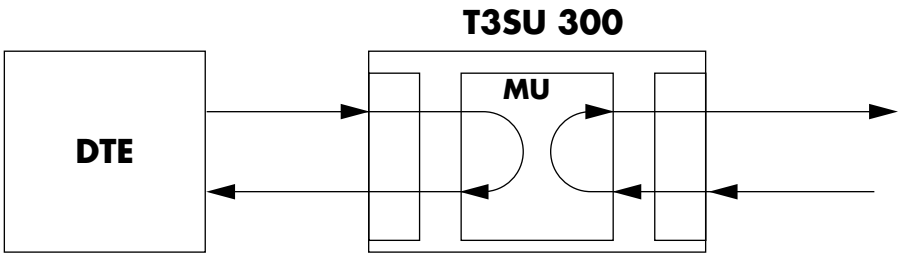


Figure 6-9. Payload and DTE Loopback Test

Remote Port Payload Loopback

This selection initiates a Payload Loopback on the remote T3SU 300 for all data on the selected port. Perform this test to verify the integrity of the portion of the DS3 link connecting the local DTE and the selected port of the remote T3SU 300. All other ports on both the local and remote units are unaffected.

Remote Payload Loopback with BERT

Perform this test to verify the integrity of the link between the selected port of the local T3SU 300 and the corresponding remote T3SU 300 port. During this test, the remote unit loops back all data for the selected port, while the local unit sends and checks the selected BERT pattern. The loopback point and the signal paths for the remote T3SU 300 are the same as the Payload Loopback test for the local T3SU 300 (shown in *Figure 6-6*).

BERT Configuration

The following options apply to any of the tests involving BERT testing.

Pattern

Select the desired test pattern for the BERT test (see *Figure 6-10*). The internal test pattern generator can be configured for the following types of test patterns:

- All Zeros
- All ones
- 2^15-1
- 2^23-1

The test pattern is used to independently test the operation of the framing circuitry and the network interface of the T3SU 300. Instead of using data from the host, this test uses data generated by the T3SU 300's internal test pattern generator and detector.

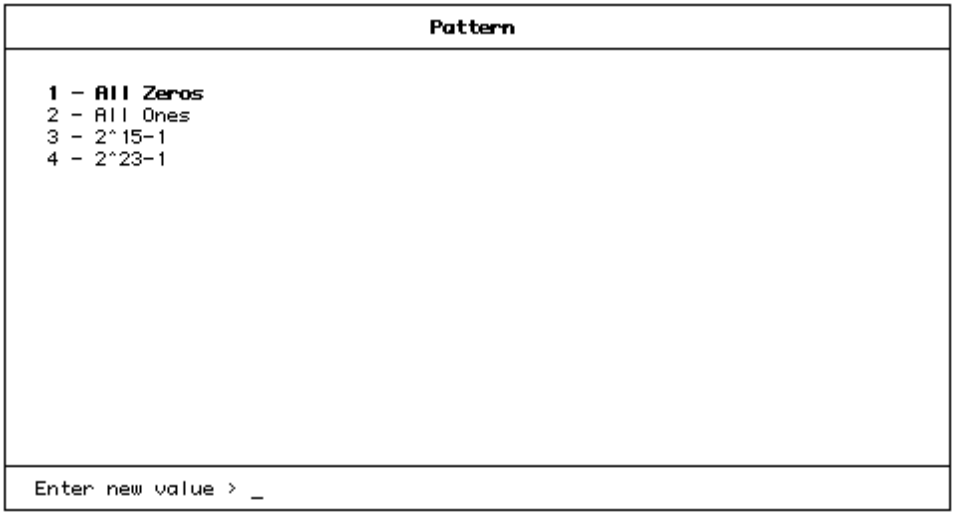


Figure 6-10. BERT Pattern Menu

Invert Pattern

If set to **ENABLE**, the T3SU 300 inverts the transmitted and received BERT test pattern. This allows the unit to be compatible with test equipment which generates inverted BERT patterns.

BERT Information Fields

The following five fields provide information about the most recently issued BERT test. These fields appear in the main **DIAGNOSTICS** menu (shown in *Figure 6-1*).

Port
Displays which port is transmitting and receiving the BERT pattern.

Direction
Displays the direction in which the BERT pattern is being sent.

State
Displays either **SYNC** or **NO SYNC** to indicate whether or not the unit is in sync with the BERT pattern.

Errors
Displays the number of BERT errors received by the T3SU 300 since the last reset.

Current Err/Sec
Displays the number of BERT errors received by the unit in the last second.

Insert Error

Inserts one error into the data stream.

Clear Errors

Clears the error counts given in the BERT information fields of this menu.

Reset All Tests

Discontinues all active tests and clears the counts displayed in the BERT information fields.

Chapter 7 Applications

This chapter provides examples of some common T3 applications. The examples include a single port DSU/CSU full T3 bandwidth application, a point-to-point multiport application (page *7-3*), a fractional T3 application (page *7-5*), and a remote SNMP management application (page *7-7*). The configuration selections given in these examples may need modification based on your network configuration.

SINGLE PORT FULL T3 BANDWIDTH

In applications requiring full T3 bandwidth, the T3SU 300 operates with other vendor products that support 44.2 Mbps data over unchannelized T3 circuits.

In the application shown in *Figure 7-1*, the T3SU 300 provides network connectivity for a router running at 44.2 Mbps. The data is frame relay and the unit is SNMP-managed via the local ethernet. See *Table 7-1* for an example configuration.

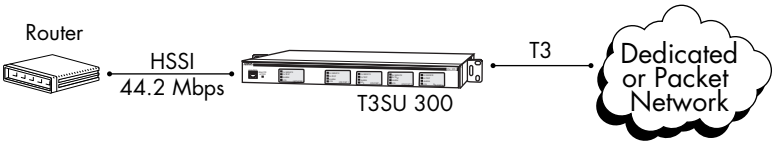


Figure 7-1. Single Port Application

Table 7-1. Configuration Example for Single Port Full T3 Bandwidth Application

	Local T3SU 300
Network	DS3 Framing - C-bit Parity
	Line Length - Short
	DS3 Timing - Loop
	Datalink - Enabled
DTE 1	Port State - Enabled
	Nx75k blocks - 588
DTE 2	Port State - Disabled
DTE 3	Port State - Disabled
DTE 4	Port State - Disabled
System Management	Local IP Address - 10.4.10.2
	Subnet Mask - 255.255.255.0
	Gateway IP Address - 10.4.10.1
	IP Security - Disabled
	Trap IP Address - 10.4.10.10
	Management Port - LAN

POINT-TO-POINT MULTIPORT APPLICATION

When networking requirements call for sharing the bandwidth of a point-to-point T3 circuit, additional data ports can be installed into the T3SU 300 for multiport operation. The T3SU 300 supports up to three port option cards (either high-speed V.35 or HSSI). These option cards are hot swappable and can be field installed. See the section *DTE Port Interface Card Slots* on page 2-4 for more information on card installation.

This application (shown in *Figure 7-2*) supports two subnet connections via two different routers, a video conferencing connection, and a main frame data connection. The T3SU 300 supports the high speed data connection requirements of the routers (using the HSSI ports), as well as the V.35 data connection requirements of the video conferencing unit and the main frame. The bandwidth is split by the T3SU 300 to provide 18 Mbps for each router, 1.5 Mbps for the video conference units, and 6 Mbps for the main frames. See *Table 7-2* for an example configuration of this application.

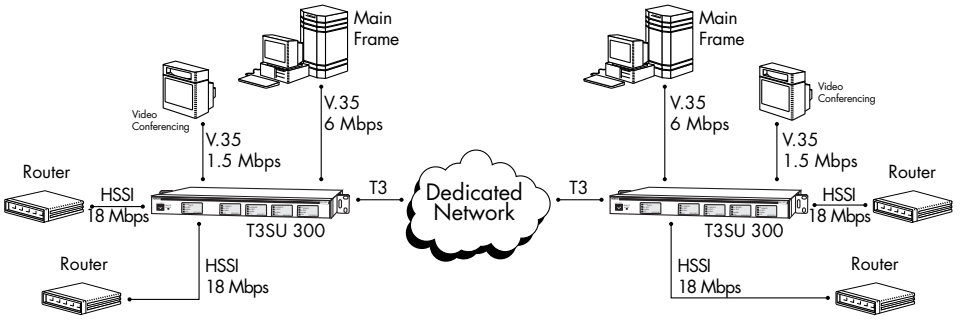


Figure 7-2. Multiport Application

Table 7-2. Configuration Example for Multiport Application

	Local T3SU 300	Remote T3SU 300
Network	DS3 Framing - C-bit Parity	DS3 Framing - C-bit Parity
	Line Length - Short	Line Length - Short
	DS3 Timing - Loop	DS3 Timing - Loop
	Datalink - Enabled	Datalink - Enabled
DTE 1 (HSSI)	Port State - Enabled	Port State - Enabled
	Nx75k blocks - 240	Nx75k blocks - 240
DTE 2 (HSSI)	Port State - Enabled	Port State - Enabled
	Nx75k blocks - 240	Nx75k blocks - 240
DTE 3 (V.35)	Port State - Enabled	Port State - Enabled
	Nx75k blocks - 80	Nx75k blocks - 80
DTE 4 (V.35)	Port State - Enabled	Port State - Enabled
	Nx75k blocks - 20	Nx75k blocks - 20
System Management	Local IP Address - 10.4.10.2	Nothing required. Remote unit can be managed using the local T3SU 300.
	Subnet Mask - 255.255.255.0	
	Gateway IP Address - 10.4.10.1	
	IP Security - Disabled	
	Trap IP Address - 10.4.10.10	
	Management Port - LAN	

FRACTIONAL T3 CARRIER APPLICATION

When network providers want to provide service at rates less than full T3, T3SU 300 units can be used in pairs for deploying sub-T3 rate services.

In this application example (shown in *Figure 7-3*), a carrier provides fractional T3 access at 8 Mbps for internet connectivity. The data connection can be either V.35 or HSSI at either location. This network uses a HSSI port at the carrier's internet POP (point of presence) and a high-speed V.35 connection at the customer's router. The carrier manages both the local and remote T3SU 300s via SNMP. *Table 7-3* gives an example configuration for this application.

NOTE

While in DTE Loopback, data from the host is transmitted into the network.

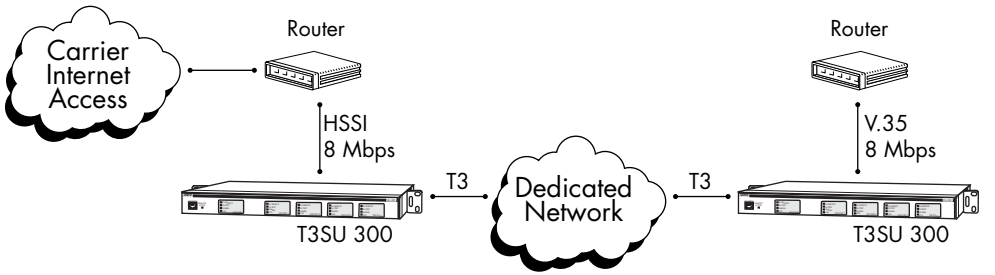


Figure 7-3. Fractional Application

Table 7-3. Configuration Example for Fractional T3 Application

	Local T3SU 300	Remote T3SU 300
Network	DS3 Framing - C-bit Parity	DS3 Framing - C-bit Parity
	Line Length - Short	Line Length - Short
	DS3 Timing - Loop	DS3 Timing - Loop
	Datalink - Enabled	Datalink - Enabled
DTE 1	Port State - Disabled	Port State - Disabled
DTE 2	Port State - Enabled	Port State - Enabled
HSSI (Local)	Nx75k blocks-107	Nx75k blocks-107
V.35 (Remote)		
DTE 3	Port State - Disabled	Port State - Disabled
DTE 4	Port State - Disabled	Port State - Disabled
System Management	Local IP Address - 12.6.12.2	Nothing required. Remote unit can be managed using the local T3SU 300.
	Subnet Mask - 255.255.255.0	
	Gateway IP Address - 12.6.12.1	
	IP Security - Disabled	
	Trap IP Address - 12.6.12.10	
	Management Port - LAN	

REMOTE SNMP MANAGEMENT APPLICATION

A remote T3SU 300 can be managed by a local management station if the remote unit is assigned its own IP address. This address must be assigned at both the near and far ends. Also, the **DATALINK** option must be enabled on both units.

In this application example (shown in *Figure 7-4*) a local T3SU 300, connected to the same LAN as the management station, provides management access to a remote T3SU 300. The local unit has the remote unit's IP address in its **REMOTE IP ADDRESS** field. That same IP address is entered into the remote unit's **LOCAL IP ADDRESS** field. *Table 7-4* gives an example configuration for this application.

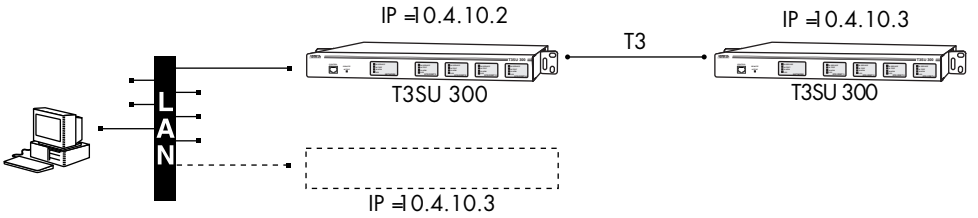


Figure 7-4. Remote Management Application

Table 7-4. Configuration Example for Remote Management Application

	Local T3SU 300	Remote T3SU 300
Network	Datalink = Enabled	Datalink = Enabled
System Management	Local IP Address=10.4.10.2	Local IP Address=10.4.10.3
	Subnet Mask=255.255.255.0	Subnet Mask=255.255.255.0
	Gateway IP Address= 10.4.10.1	Gateway IP Address= 0.0.0.0
	Remote IP Address=10.4.10.3	Remote IP Address= 0.0.0.0
	Management Port=LAN	Management Port=FDL

Appendix A Pinouts

The following tables give the pin assignments for the connectors located on the T3SU 300 and for the V.35 interface card. For more information on these connectors, see the chapter *Installation and Operation* on page 2-1.

Table A-1. Control and Auxiliary Port Pin Assignments

RJ Pin#	Function	Direction
1	GND	
2	RTS	I
3	TD	I
4	DSR	O
5	RD	O
6	CTS*	O
7	DTR	I
8	DCD	O
*Used for hardware flow control.		

Table A-2. HSSI Interface Pin Assignments

Pin # (+ side)	Pin # (- side)	Direction	Description
1	26		Signal Ground (SG)
2	27	O	Receive Timing (RT)
3	28	O	DCE Available (CA)
4	29	O	Receive Data (RD)
5	30	O	Loopback Circuit C (LC)
6	31	O	Send Timing (ST)
7	32		Signal Ground (SG)
8	33	I	DTE Available (TA)
9	34	I	Terminal Timing (TT)
10	35	I	Loopback Circuit A (LA)
11	36	I	Send Data (SD)
12	37	I	Loopback Circuit B (LB)
13	38		Signal Ground (SG)
14-18	39-43	I	Five Ancillary to DCE
19	44		Signal Ground (SG)
20-23	45-48	O	Five Ancillary from DCE
24	49	O	Test Mode (TM)
25	50		Signal Ground (SG)

Table A-3. V.35 Interface Card Pin Assignments

Pin	CCITT	Description
A	101	Protective Ground (PG)
B	102	Signal Ground (SG)
C	105	Request to Send (RTS)
D	106	Clear to Send (CTS)
E	107	Data Set Ready
F	109	Received Line Signal Detector (CD)
H	-	Data Terminal Ready (DTR)
J	-	not used
L	-	Local Loopback (LL)
N	-	Remote Loopback (RL)
R	104	Received Data (RD-A)
T	104	Received Data (RD-B)
V	115	Receiver Signal Element Timing (SCR-A)
X	115	Receiver Signal Element Timing (SCR-B)
P	103	Transmitted Data (SD-A)
S	103	Transmitted Data (SD-B)
Y	114	Transmitter Signal Element Timing (SCT-A)
AA	114	Transmitter Signal Element Timing (SCT-B)
U	113	External TX Signal Element (SCX-A)
W	113	External TX Signal Element (SCX-B)
NN	-	Test Indicator (TI)

Table A-4. LAN Port Pin Assignments

Pin	Name	Description
1	TD+	The positive signal for the TD differential pair. This signal contains the serial output data stream transmitted onto the network.
2	TD-	The negative signal for the TD differential pair (pins 1 and 2).
3	RD+	The positive signal for the RD differential pair. This signal contains the serial input data stream received from the network.
4, 5	N/A	not used
6	RD-	The negative signal for the RD differential pair (pins 3 and 6).
7, 8	N/A	not used

Appendix B Specifications Summary

SPECIFICATIONS AND FEATURES

This section describes the standard specifications and features incorporated in the T3SU 300.

Network Interface

Clear channel, non-channelized DS3.
Line buildout: short (less than 50 feet) and long (greater than 50').
Framing format: M13 and C-bit parity.
Line rate: 44.736 Mbps.
Line interface: 75-ohm BNC coax female connectors.

DTE Interface(s)

Integrated HSSI port.
Three (3) option slots accept any combination of interface cards.
HSSI ports are SCSI-II 50-pin female.
V.35 ports are high-speed, M34 female.
All option cards are hot swappable.

DTE Rates Supported

HSSI port(s) support 75 kbps to 44.2 Mbps.
V.35 port(s) support 75 kbps to 10 Mbps.
Bandwidth is selectable in 75 kbps increments.

Clocking

Loop (slaved to network receive clock)
Local (private network master)

VT 100 Terminal Interface

RJ-48, EIA -232 compatible, female DB-25 adapter provided.
Accessible through front or rear panel.
Remote configuration and statistics access available inband.

SNMP/Telnet

Integrated 10baseT ethernet and SLIP / PPP (async) port.
MIB II, RFC 1213 and 1407 compliant.
ADTRAN Enterprise MIB for extended monitoring and control / configuration.

Agency Approvals

FCC Part 15, Class A, UL and CUL

Environment

Operating: 0 to 50 °C (32 to 122 °F)
Storage: -20 to 70 °C (-4 to 158 °F)
Relative Humidity: Up to 95%, non-condensing

Physical

Dimensions: 11.625“D x 17.0“W x 1.7“H (for 1U high 19” rack space)
Weight: 7 lbs.
Power: 120 VAC, 9 W

Appendix C Acronyms/Abbreviations

AIS..... alarm indication signal
AMI..... alternate mark inversion
ANSI..... American National Standards Institute
async..... asynchronous
BERT..... bit error rate test
bps..... bits per second
BPV..... bipolar violation
CA..... communications equipment available
CCITT..... Consultive Committee for International Telephony and Telegraphy
CCV..... C-bit coding violation
CD..... carrier detect
CES..... C-bit errored seconds
CO..... central office
CPE..... customer premise equipment
CRC..... cyclic redundancy check
CS..... clear to send
CSES..... C-bit severely errored seconds
CSU..... channel service unit
CTS..... clear to send
dB..... decibel
DBU..... dial backup
DCD..... data carrier detect
DCE..... data communications equipment

DDS..... digital data service
DLCI..... data link connection identifier
DS1..... digital signal level one
DS3..... digital signal level three
DSR..... data set ready
DSU..... data service unit
DTE..... data terminal equipment
DTR..... data terminal ready
ES..... errored seconds
EXZ..... excessive zeros
FBE..... F-bit errors
FCC..... Federal Communications Commission
FDL..... facility datalink
FEBE..... far end block error
HSSI..... high-speed serial interface
IP..... internet protocol
KA..... keep alive
LAN..... local area network
LCV..... line coding violation
LED..... light emitting diode
LES..... line errored seconds
LL..... local loopback
LOS..... loss of signal
MBE..... M-bit errors
Mbps..... megabits per second
MIB..... management information base
ms..... millisecond
NC..... normally closed
NI..... network interface
NMS..... network management system
NO..... normally open
NRZ..... non-return to zero
OCU..... office channel unit

OOF..... out of frame
OOS..... out of service
PCV ..... P-bit coding violation
PES ..... P-bit errored seconds
POP ..... point of presence
PPP ..... point-to-point protocol
PSES..... P-bit severely errored seconds
PSTN..... public switched telephone network
PVC ..... permanent virtual circuit
RD ..... receive data
RDL..... remote digital loopback
RL ..... remote loopback
RMA..... return material authorization
RS ..... request to send
RTS..... request to send
Rx..... receive
SEFS ..... severely errored framing seconds
SES ..... severely errored seconds
SLIP..... serial line internet protocol
SNMP ..... simple network management protocol
SR ..... data set ready
SW56 ..... switched 56
sync ..... synchronous
TA ..... terminal equipment available
TD..... transmit data
TDM..... time division multiplexing
TM ..... test mode
TR ..... data terminal ready
Tx..... transmit
UAS..... unavailable seconds
WAN..... wide area network

Appendix D Glossary

10baseT

Ethernet connector which implements the IEEE standard on 24-gauge, unshielded twisted pair wiring.

AIS

alarm indication signal. An unframed all ones pattern that replaces the normal traffic signal when a failure has been detected. This signal prevents logical connections from terminating between devices.

AMI

alternate mark inversion. A bipolar line-coding format in T1 transmission systems whereby successive ones are alternately inverted.

ANSI

American National Standards Institute. A non-profit organization that coordinates voluntary standards activities in the United States.

asynchronous

A method of data transmission which allows characters to be sent at irregular intervals by preceding each character with a start bit, followed by a stop bit.

bandwidth

The bandwidth determines the rate at which information can be sent through a channel (the greater the bandwidth, the more information that can be sent in a given amount of time).

baud rate

A measure of transmission speed over an analog phone line. Baud rate measures the shortest signaling elements per second in the analog signal that a modem sends over an analog phone line. Does not necessarily equal the bit rate.

BERT

bit error rate test. A test that uses any of a number of stress patterns to test T3, T1, FT1, and DDS circuits.

bipolar

A signal containing both positive and negative amplitude components.

bipolar violation

See *BPV*.

bit

A binary digit representing a signal, wave, or state as either a one or a zero. A bit is the smallest unit of information a computer can process.

bit error

The receipt of an encoded bit that differs from what was sent by the transmitter.

bit rate

The speed at which bits are transmitted, usually expressed in bits per second (bps).

blue alarm (AIS)

An alarm used in T1/T3 transmission. In a T3 circuit, blue alarms occur when there is a transmission fault located either at or upstream from the transmitting terminal. A blue alarm is when consecutive 1010's are received in the information bits.

bps

bits per second. The number of bits passing a specific point per second. Examples of common rates are kbps (one thousand bits per second) and Mbps (one million bits per second). T3 operates at 44.736 Mbps.

BPV

bipolar violation. A violation in the alternate mark inversion line code for which consecutive 1s are represented by pulses of opposite polarity. BPVs that are not

intentional (B8ZS) are counted as errors. Could also be the presence of two consecutive 1 bits of the same polarity on the T-carrier line.

bridge

A data communications device that connects two or more networks and forwards packets between them.

byte

Generally, an 8-bit quantity of information. This term is used mainly in referring to parallel data transfer, semiconductor capacity, and data storage.

carrier

The provider of the telecommunication services to the customer site. Carriers can be local telephone companies, regional telephone companies, or any interexchange carrier such as AT&T, Sprint, or MCI.

C-bit

An overhead bit in the DS3 string not used for framing, parity, or alarm indication.

CCITT

Consultive Committee for International Telephony and Telegraphy. A standards organization that devises and proposes recommendations for international communications. See also *ANSI*.

CD

carrier detect. A signal generated by a modem or DSU / CSU indicating the presence of a carrier signal on a communications link.

channel

A transmission path between two or more termination points; also called a circuit, facility, line, link, or path.

channel bank

Equipment in a telephone central office or customer premises that performs multi-plexing of lower speed digital channels into a higher speed composite channel. The channel bank also detects and transmits signaling information for each channel; thereby transmitting framing information so that time slots allocated to each channel can be identified by the receiver.

channel service unit

See *CSU*.

clocking

An oscillator-generated signal that provides a timing reference for a transmission link. A clock provides signals used in a transmission system to control the timing of certain functions. The clock has two functions: (1) to generate periodic signals for synchronization, and (2) to provide a time base.

control port

The electrical interface between the T3SU 300 and the control terminal. The control terminal is used to communicate commands to the unit.

CPE

customer premise equipment. All telecommunications terminal equipment located on the customer premises, including telephone sets, private branch exchanges (PBXs), data terminals, and customer-owned coin-operated telephones.

CSU

channel service unit. A device used to connect a digital phone line coming in from the phone company to either a multiplexer, channel bank, or directly to another device producing a digital signal; for example, a digital PBX, a PC, or data communications device. A CSU performs certain line-conditioning and equalization functions, and responds to loopback commands sent from the central office. A CSU regenerates digital signals. It monitors them for problems and provides a way of testing the digital circuit.

CTS

clear to send. A signal on the DTE interface indicating that the DCE is clear to send data.

data communications equipment

See *DCE*.

data service unit

See *DSU*.

dB

decibel. A unit of measure of signal strength; usually the relation between a transmitted signal and a standard signal source.

DCE

data communications equipment. Device that provides all the functions required for connection to telephone company lines and for converting signals between telephone lines and DTE. Also see *DTE*.

DDS

digital data service. A private line digital service for transmitting data end-to-end at speeds of 2.4, 4.8, 9.6, and 56 kbps (and in some cases 19.2, 38.4, or 64 kbps). The systems can use central hub offices for obtaining test access, bridging legs of multi-point circuits, and cross connecting equipment. DDS is offered on an inter-LATA basis by AT&T and on an intra-LATA basis by the Bell operating companies.

delay

The amount of time by which a signal is delayed. A round-trip transmission delay measurement helps detect possible causes of protocol timeouts.

DLCI

datalink communications identifier. A unique number assigned to a PVC end point in a frame relay network. Identifies a particular PVC endpoint within a user's access channel in a frame relay network and has local significance only to that channel.

DS1

digital signal level one. Twenty-four DS0 channels make up one DS1 (total bandwidth is 1.544 Mbps).

DS3

digital signal level three. Equivalent of 28 DS1s and 672 DS0s (total bandwidth is 44.736 Mbps).

DSU

data service unit. A device designed to transmit and receive digital data on digital transmission facilities.

DTE

data terminal equipment. The end-user terminal or computer that plugs into the termination point (DCE) of a communications circuit. The main difference between the DCE and the DTE is that pins two and three are reversed.

E1

Transmission rate of 2.048 Mbps on E1 communications lines. See also *T1*.

end device

The ultimate source or destination of data flowing through a network (sometimes referred to as DTE).

end user

Subscriber who uses (rather than provides) telecommunications services.

ES

errored seconds. A second with one or more coding violations (CVs).

ethernet

Transmission protocol for packet-switching LANs.

facilities

The equipment used by carriers to provide communication services.

far end

The distant end to that being considered. Not the end where testing is being carried out.

FCC

Federal Communications Commission. The U.S. federal agency responsible for regulating interstate and international communications by radio, TV, wire, satellite, and cable.

FDL

facility datalink. FDL bits provide overhead communication between the terminal equipment in ESF framing.

gateway

A device which enables information to be exchanged between two dissimilar systems or networks.

host computer

The primary or controlling computer in a multiple computer operation.

idle code

In a T3 circuit, an idle code consists of a sequence of 1100 over the entire payload bandwidth.

in-band

Signaling (dialing, diagnostics, management, configuration, etc.) over the same channel used for data.

IP

internet protocol. A protocol which provides for transmitting blocks of data between hosts identified by fixed-length addresses.

LAN

local area network. A privately owned network that offers high-speed communications channels to connect information processing equipment in a limited geographic area.

local loopback (LL)

A type of test used to verify the operation of the local terminal equipment, the CSU, and the connection between the two. The signal from the DTE is looped back by the CSU and is sent back to the DTE.

loopback

The technique for testing the processing circuitry of a communications device. May be initiated locally or remotely via a telecommunications circuit. Device being tested will echo back received test data. The results are compared with the original data.

LOS

loss of signal. Defined as a line state in which no pulses are received for 175 bit positions.

M13

DS1/DS3 multiplexer that combines up to 28 DS1 channels into one DS3 channel. Uses two-stage, bit synchronous TDM.

Mbps

Megabits per second (one million bits per second).

MIB

management information base. A database of network management information used by SNMP.

modem

Acronym for modulator/demodulator. Equipment that converts digital signals to and from analog signals. Used to send digital signals over analog phone lines.

monitor

To watch or listen to a signal non-intrusively.

multi-point circuit

A single communications circuit that has more than two terminations.

NC

normally closed. Relay switch contacts that remain closed when inactive.

near end

The unit on-site.

NI

network interface. The demarcation point between the CPE and the PSTN.

NO

normally open. Relay switch contacts that remain open when inactive.

NRZ

non return to zero. A mode in which the digital level is low for a 0 bit and high for a 1 bit, and does not return to zero between successive 1 bits.

out-of-band

Signaling that is separated from the channel carrying information (voice, data, video, etc.). Typically the separation is accomplished by a filter. The signaling includes dialing and other supervisory signals.

point-to-point

Type of communications link that connects a single device to another single device, such as a remote terminal to a host computer.

POP

point of presence. Physical place within a LATA (local access and transport area) where a long distance carrier or a cellular provider interfaces with the network of the local exchange carrier (LEC). A POP is usually a building serving as the point of termination which houses switches and transmission equipment.

protocol

A set of rules controlling the orderly exchange of information between stations in data communications networks or systems.

PSTN

public switched telephone network. Usually refers to the world wide voice telephone network available for public use.

red alarm

Unframed all ones signal (keep alive signal). A red alarm is declared on detection of LOS or OOF not caused by an alarm indication signal (AIS) that persists for more than two seconds.

remote configuration

A feature designed into ADTRAN products that allows remote units to be configured from a local unit or a VT 100 compatible terminal.

router

A device that supports communications between networks. Routers are similar to bridges, with the exception that routers provide more functionality (such as finding the best route between networks and providing network management capabilities).

service

The provision of telecommunications to customers by a common carrier, administration, or private operating agency, using voice, data, and/or video technologies.

service provider

A company that delivers or sells a telecom service.

SES

severely errored seconds. A second in which more than 320 code violations (CVs) occurred or an OOF condition occurred.

signaling
Communication between switches to set up and terminate calls.

SNMP
simple network management protocol. A control and reporting scheme widely used to manage devices from different vendors. SNMP operates on top of the Internet protocol.

SR
data set ready. A signal on the DTE interface that indicates if a connection exists and if the devices are ready to start handshaking control signals so communications can begin.

synchronous
Communications in which the timing is achieved by sharing a single clock. Each end of the transmission synchronizes itself with the use of clocks and information sent along with the transmitted data.

T1
Transmission rates of 1.544 Mbps are available on T1 communication lines. Also referred to as digital signal level 1 (DS-1). See also *E1*.

T3
Transmission rates of 44.736 Mbps are available on T3 communication lines. Also referred to as digital signal level 3 (DS-3).

TDM
time division multiplexing. A technique for transmitting two or more signals at the same time over a single communication medium. This is accomplished by allocating channels to the bandwidth for specific increments of time.

TELNET
The standard TCP/IP remote login protocol specified in RFC-854.

transceiver
A combination of transmitter and receiver providing both output and input interfaces within a single device.

transmission
The signaling of data over telecommunications channels.

V.35

A standard for trunk interface between a network access device and a packet network that defines signaling for data rates greater than 19.2 kbps.

VT 100

A non-intelligent terminal or terminal emulation mode used for asynchronous communications. Used to configure the T3SU 300.

WAN

wide area network. A communications network serving geographically separate areas. A WAN typically extends a LAN outside the building to link to other LANs over telephone lines.

yellow alarm

A T3 yellow alarm is an indication sent back toward the source of a failed transmit circuit in a DS3 two-way transmission path. The X-bits (X1 and X2) are set to zero.

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Product Support Information

Pre-Sales Inquiries and Applications Support

Please contact your local distributor, ADTRAN Applications Engineering, or ADTRAN Sales:

Applications Engineering	(800) 615-1176
Sales	(800) 827-0807

Post-Sale Support

Please contact your local distributor first. If your local distributor cannot help, please contact ADTRAN Technical Support and have the unit serial number available.

Technical Support	(888) 4ADTRAN

Repair and Return

If ADTRAN Technical Support determines that a repair is needed, Technical Support will coordinate with the Customer and Product Service (CAPS) department to issue a Return Material Authorization (RMA) number. For information regarding equipment currently in house or possible fees associated with repair, contact CAPS directly at the following number:

CAPS Department	(256) 963-8722

Identify the RMA number clearly on the package (below address), and return to the following address:

ADTRAN Customer and Product Service
6767 Old Madison Pike
Progress Center
Building #6 Suite 690
Huntsville, Alabama 35807

RMA # _____